For greener future

NIETZ

POWER MODULES

Inverters /EV /Solar /wind Power

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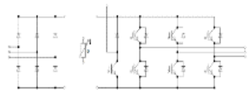
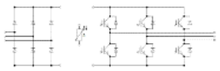
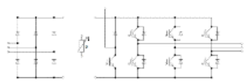
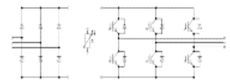
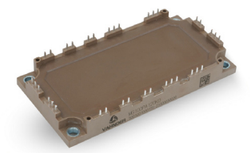
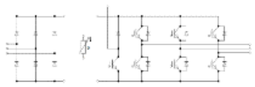
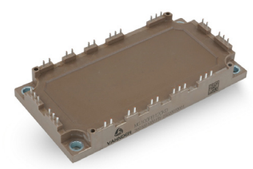
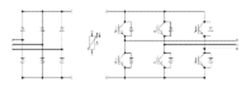
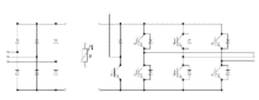
PRODUCT SELECTION GUIDE

NIETZ

IGBT Module Profile

產品型號 Device	晶片特性 chip characteristics	V_{CES} (v)	Ic @Tc=100℃	$V_{CE(sat)}$ @Tj=25 ℃ typ(V)	$E_{on}+E_{off}$ @Tj=25 ℃typ(V)	$R_{th(J-C)}$ K/W	封裝類型 Package	Outline	Configuration	拓樸電路 Circuit	應用場景 Application
MG050PA120N0	低損快速 Low loss, fast	1200	50	2.31	9.76@Rg=15Ω	0.54	EconoPIM2		PIM with Brake		小功率工業變頻 Low Power Industrial Inverter 馬達驅動 Motor Drives 伺服驅動 Servo Drives
MG050PB120N0	低損快速 Low loss, fast	1200	50	2.31	9.76@Rg=15Ω	0.54	EconoPIM2		PIM w/o Brake		小功率工業變頻 Low Power Industrial Inverter 馬達驅動 Motor Drives 伺服驅動 Servo Drives
MG075PA120K0	低損快速 Low loss, fast	1200	75	1.85	14.25@Rg=10Ω	0.48	EconoPIM3		PIM with Brake		中功率工業變頻 Medium Power Industrial Inverter 馬達驅動 Motor Drives 伺服驅動 Servo Drives
MG075PB120K0	低損快速 Low loss, fast	1200	75	1.85	14.25@Rg=10Ω	0.48	EconoPIM3		PIM w/o Brake		中功率工業變頻 Medium Power Industrial Inverter 馬達驅動 Motor Drives 伺服驅動 Servo Drives
MG100PA120K0	低損快速 Low loss, fast	1200	100	2.35	18.17@Rg=6.8Ω	0.26	EconoPIM3		PIM with Brake		中功率工業變頻 Medium Power Industrial Inverter 馬達驅動 Motor Drives 伺服驅動 Servo Drives
MG100PB120K0	低損快速 Low loss, fast	1200	100	2.35	18.17@Rg=6.8Ω	0.26	EconoPIM3		PIM w/o Brake		中功率工業變頻 Medium Power Industrial Inverter 馬達驅動 Motor Drives 伺服驅動 Servo Drives
MG150PA120K1	低損快速 Low loss, fast	1200	150	2.15	32.08@Rg=6.8Ω	0.25	EconoPIM3		PIM with Brake		中功率工業變頻 Medium Power Industrial Inverter 馬達驅動 Motor Drives 伺服驅動 Servo Drives

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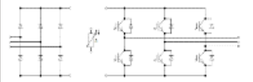
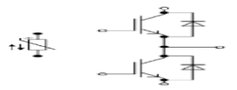
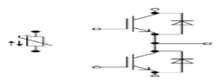
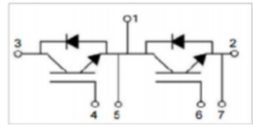
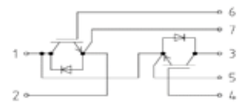
IGBT Module Profile

產品型號 Device	晶片特性 chip characteristics	V_{CES} (v)	Ic @Tc=100℃	$V_{CES(sat)}$ @Tj=25 ℃ typ(V)	$E_{on}+E_{off}$ @Tj=25 ℃typ(V)	$R_{th(J-C)}$ K/W	封裝類型 Package	Outline	Configuration	拓樸電路 Circuit	應用場景 Application
MG150PB120K1	低損快速 Low loss, fast	1200	150	2.15	32.08@Rg=6.8Ω	0.25	EconoPIM3		PIM w/o Brake		中功率工業變頻 Medium Power Industrial Inverter 馬達驅動 Motor Drives 伺服驅動 Servo Drives
MG300DA120M0	低損快速 Low loss, fast	1200	300	2.1	32.08@Rg=10Ω	0.3	EconoDual3		Half Bridge		大功率工業變頻 High Power Industrial Inverter 馬達驅動 Motor Drives 伺服驅動 Servo Drives
MG450DA120M0	低損快速 Low loss, fast	1200	450	1.6	105@Rg=2Ω	0.0875	EconoDual3		Half Bridge		大功率工業變頻 High Power Industrial Inverter 馬達驅動 Motor Drives 伺服驅動 Servo Drives
M G100DB120T1	低損快速 Low loss, fast	1200	100	2.5	@Rg=10Ω	0.17	34 mm		Half Bridge		中功率工業變頻 Medium Power Industrial Inverter 馬達驅動 Motor Drives 伺服驅動 Servo Drives
M G300DB120T0	低損快速 Low loss, fast	1200	300	1.9	@Rg=5.5 Ω	0.093	62mm		Half Bridge		大功率工業變頻 High Power Industrial

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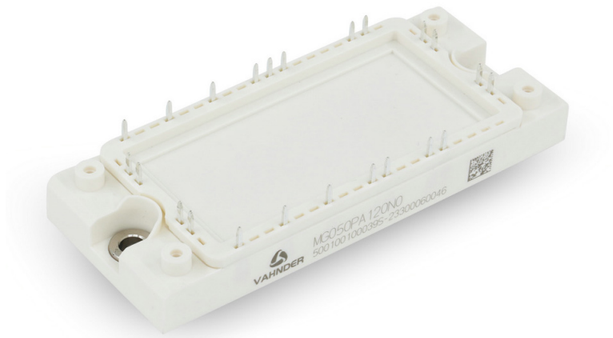

MG050PA120N0

1200V50A EconoPIM2 IGBT Module

NIETZ | MG050PA120N0

IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200	V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\,nom}$	50	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	100	A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}	210	W
Gate-emitter peak voltage		V_{GES}	+/- 20	V

Characteristic value

				min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$	1.7	2.1	2.3	V
	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 125°C					V
	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 150°C			2.6		V
Gate threshold voltage	I_C = 1mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.3	6.0	6.3	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G		0.44		µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}				Ω
Input capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{ies}				nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{res}				nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Turn-on delay time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C			0.32		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	$T_{d,on}$				us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C					us
Rise time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C			0.08		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	T_r				us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C					us
Turn-off delay time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C			0.20		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	$T_{d,off}$				us
	R_{Goff} = 15Ω	T_{vj} = 150°C					us
Fall time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C			0.28		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	T_f				us
	R_{Goff} = 15Ω	T_{vj} = 150°C					us
Turn-on energy loss per pulse	I_C =50A, V_{CE} = 600V, L_S =20 nH	T_{vj} = 25°C			4.5		mJ
	V_{GE} = +15/-15V, di/dt =570A/µs	T_{vj} = 125°C	E_{on}				mJ
	R_{Gon} = 15Ω	T_{vj} = 150°C					mJ
Turn-off energy loss per pulse	I_C = 50A, V_{CE} = 600V, L_S = 20nH	T_{vj} = 25°C			3.2		mJ
	V_{GE} =+15/-15V, dv/dt =5400V/µs	T_{vj} = 125°C	E_{off}				mJ
	R_{Goff} = 15Ω	T_{vj} = 150°C					mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 25°C , R_G =10Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt		I_{SC}		340		A

Thermal resistance, junction to case	per IGBT, grease = 1.3 W/(m·K)	$R_{th,JC}$			0.589	K/W

Diode, Inverter

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}		1200		V
Continuous DC forward current		I_F		50		A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}		100		A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F	2.0	2.4	2.5	V
	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 125°C					V
	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 150°C			1.8		V
Peak reverse recovery current	I_F = 50A, V_R = 600V	T_{vj} = 25°C	I_{RM}		50		A
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Recovered charge	I_F = 50A, V_R = 600V	T_{vj} = 25°C	Q_r		5.5		μC
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Reverse recovery energy	I_F = 50A, V_R = 600V	T_{vj} = 25°C	E_{rec}		1.5		mJ
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Thermal resistance, junction to case	Per diode, grease = 1.3 W/(m·K)		$R_{th,JC}$			0.69	K/W

Diode, Rectifier

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1600		V
Average Rectified Output current	V_F = 1.2, T_{vj} = 150°C	I_F	50		A
Surge forward current	t_p = 10 ms, Tvj = 150°C	I_{FSM}	320		A
I^2t - value	t_p = 10 ms, Tvj = 150°C	I^2t	510		A^2s

Characteristic value

			min.	typ.	max.	
Forward voltage	T_{vj} = 150°C, I_F = 50 A	V_F		1.2		V
Reverse current	T_{vj} = 150°C, V_R = 1600 V	I_R		1		mA
Thermal resistance, junction to case	per Diode	R_{thJC}			0.74	K/W
Thermal resistance, junction to heatsink	per Diode, λ grease = 1.3 W/(m·K)	R_{thJH}				K/W

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NIETZ MG050PA120N0

IGBT, Brake-Chopper

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200		V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	50		A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	100		A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}	210		W
Gate-emitter peak voltage		V_{GES}	+/- 20		V

Characteristic value

				min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$	1.7	2.1	2.3	V
	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 125°C					V
	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 150°C			2.6		V
Gate threshold voltage	I_C = 1mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.3	6.0	6.3	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G		0.44		µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}				Ω
Input capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V		C_{ies}				nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V		C_{res}				nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Turn-on delay time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,on}$		0.32		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C					us
Rise time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C	T_r		0.08		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C					us
Turn-off delay time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,off}$		0.20		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	R_{Goff} = 15Ω	T_{vj} = 150°C					us
Fall time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C	T_f		0.28		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	R_{Goff} = 15Ω	T_{vj} = 150°C					us
Turn-on energy loss per pulse	I_C =50A, V_{CE} = 600V, L_S =20 nH	T_{vj} = 25°C	E_{on}		4.5		mJ
	V_{GE} = +15/-15V, di/dt =570A/µs	T_{vj} = 125°C					mJ
	R_{Gon} = 15Ω	T_{vj} = 150°C					mJ
Turn-off energy loss per pulse	I_C = 50A, V_{CE} = 600V, L_S = 20nH	T_{vj} = 25°C	E_{off}		3.2		mJ
	V_{GE} =+15/-15V, dv/dt =5400V/µs	T_{vj} = 125°C					mJ
	R_{Goff} = 15Ω	T_{vj} = 150°C					mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 25°C , R_G =10Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt		I_{SC}		340		A

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Thermal resistance, junction to case	per IGBT, grease = 1.3 W/(m·K)	$R_{th,JC}$			0.589	K/W

Diode, Brake-Chopper

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1200	V
Continuous DC forward current		I_F	50	A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}	100	A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F	2	2.4	2.5	V
	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 125°C					V
	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 150°C			1.8		V
Peak reverse recovery current	I_F = 50A, V_R = 600V	T_{vj} = 25°C	I_{RM}		50		A
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Recovered charge	I_F = 50A, V_R = 600V	T_{vj} = 25°C	Q_r		5.5		μC
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Reverse recovery energy	I_F = 50A, V_R = 600V	T_{vj} = 25°C	E_{rec}		1.5		mJ
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Thermal resistance, junction to case	Per diode, grease = 1.3 W/(m·K)		$R_{th,JC}$			0.69	K/W

NTC-Thermistor

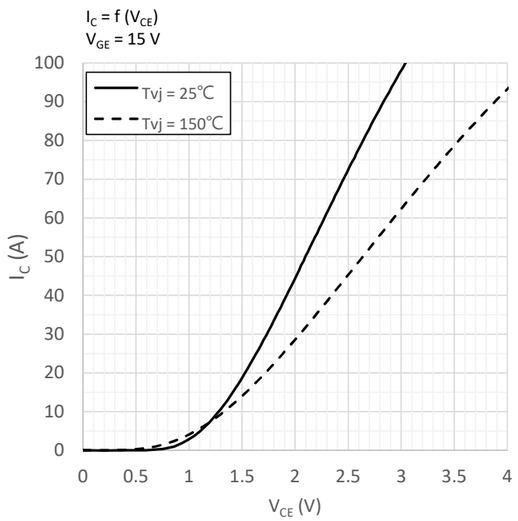
Characteristic value

			min.	typ.	max.	
Rated resistance	Tc = 25°C	R_{25}		5.07		KΩ
Power dissipation	Tc = 25°C	P_{25}			240	mW
B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298, 15K))]$	B_{25}/B_{50}		3412.7		K
B-value	$R_2=R_{25}\exp[B_{25/75}(1/T_2-1/(298, 15K))]$	B_{25}/B_{75}		3454.8		K
B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298, 15K))]$	B_{25}/B_{100}		3442.2		K

NIETZ MG050PA120N0

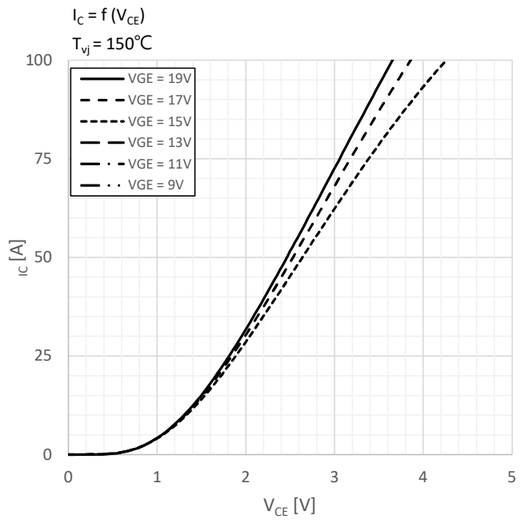
Output characteristic IGBT, Inverter (typical)

$I_C = f(V_{CE})$
V_{GE} = 15 V



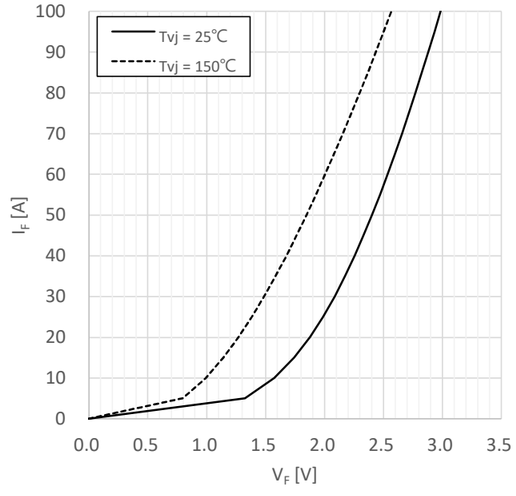
Output characteristic IGBT, Inverter (typical)

$I_C = f(V_{CE})$
T_{vj} = 150°C



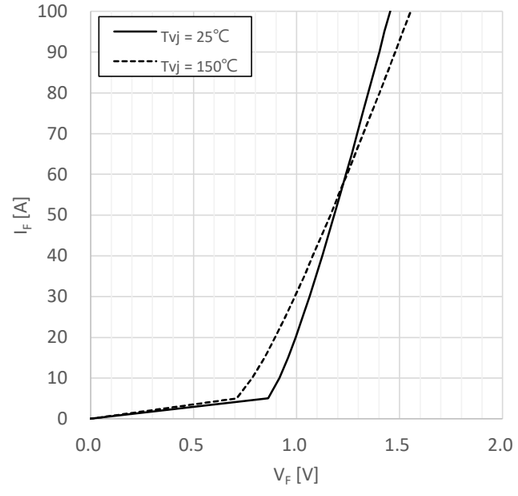
Forward characteristic of Diode, Inverter (typical)

$I_F = f(V_F)$

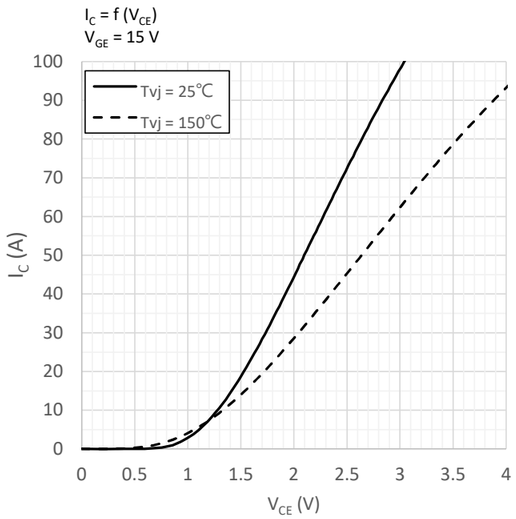


Forward characteristic of Diode, Rectifier (typical)

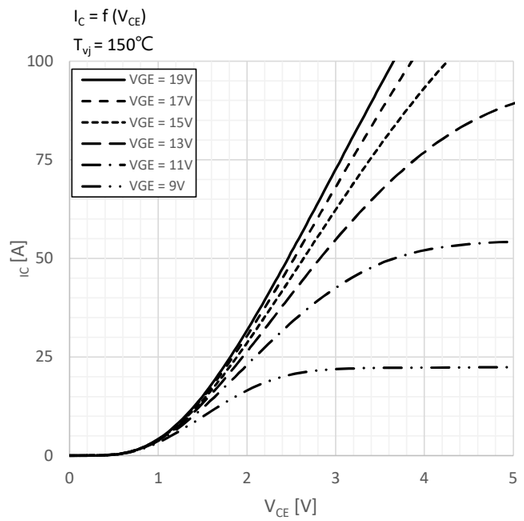
$I_F = f(V_F)$



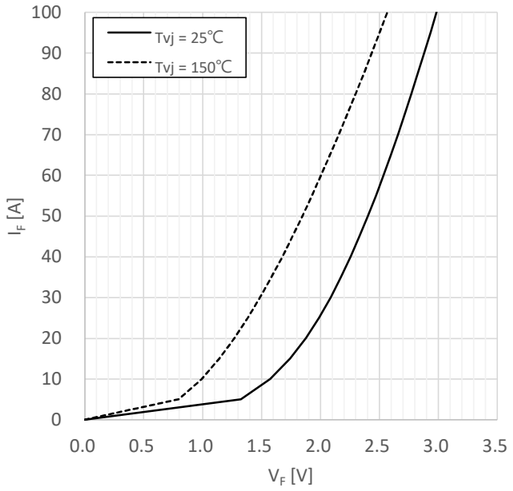
Output characteristic IGBT, Brake-Chopper (typical)



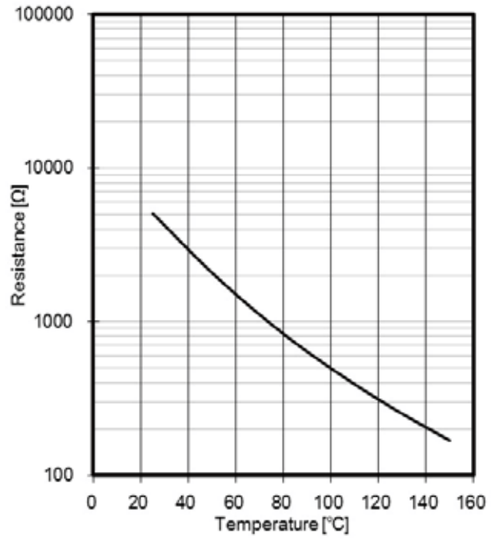
Output characteristic IGBT, Brake-Chopper (typical)



Forward characteristic of Diode, Brake-Chopper (typical)
$I_F = f(V_F)$



NTC-Thermistor-temperature characteristic (typical) R=f(T)



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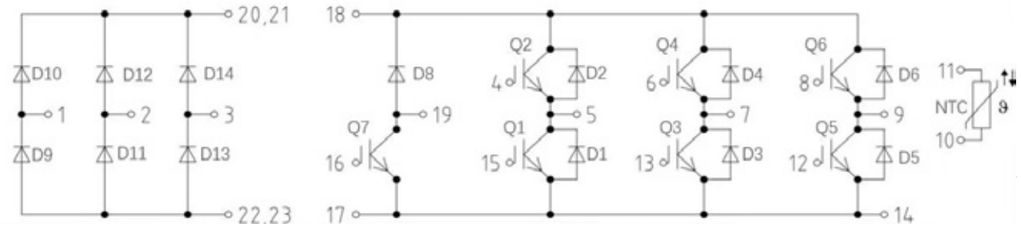
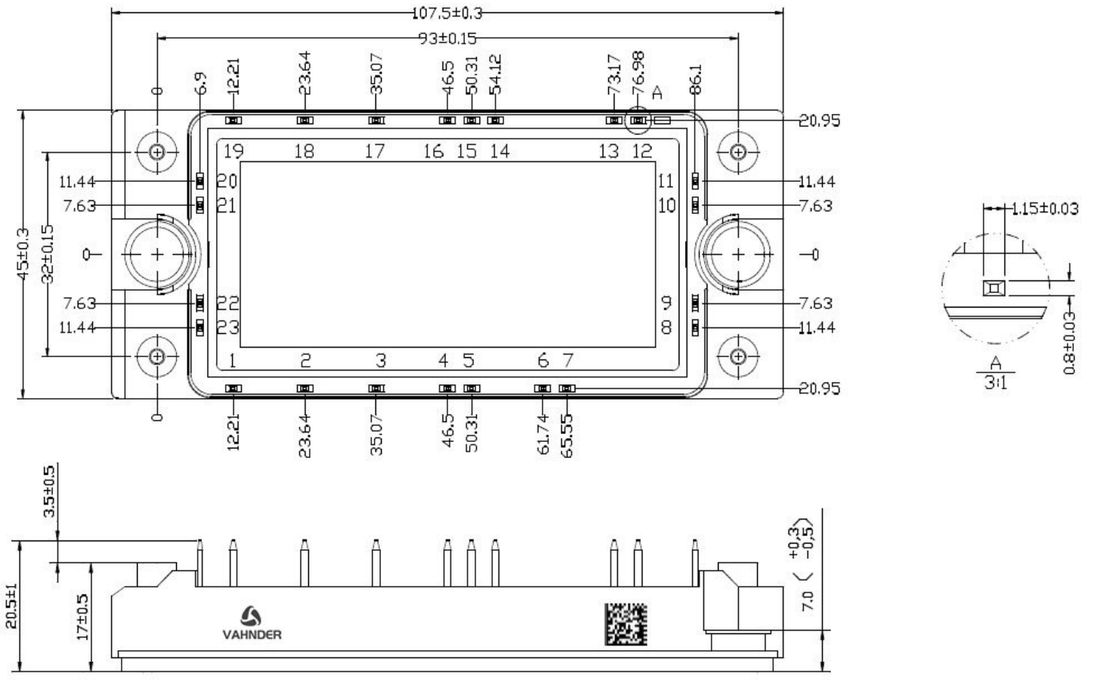
Circuit Diagram



Package outlines



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MG050PB120N0

1200V50A EconoPIM2 IGBT Module

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IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200	V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	50	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	100	A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}	210	W
Gate-emitter peak voltage		V_{GES}	+/- 20	V

Characteristic value

			min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 25°C	1.7	2.1	2.3	V
	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 125°C				V
	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 150°C		2.6		V
Gate threshold voltage	I_C = 1mA, V_{CE} = V_{GE}, T_{vj} = 25°C	$V_{GE,th}$	5.3	6.0	6.3	V
Gate charge	V_{GE} = -15 V ... +15 V	Q_G		0.44		µC
Internal gate resistor	T_{vj} = 25°C	R_{Gint}				Ω
Input capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V	C_{ies}				nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V	C_{res}				nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C	I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C	I_{GES}			100	nA
Turn-on delay time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C		0.32		us
	V_{GE} = +15/-15V	T_{vj} = 125°C				us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C				us
Rise time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C		0.08		us
	V_{GE} = +15/-15V	T_{vj} = 125°C				us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C				us
Turn-off delay time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C		0.20		us
	V_{GE} = +15/-15V	T_{vj} = 125°C				us
	R_{Goff} = 15Ω	T_{vj} = 150°C				us
Fall time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C		0.28		us
	V_{GE} = +15/-15V	T_{vj} = 125°C				us
	R_{Goff} = 15Ω	T_{vj} = 150°C				us
Turn-on energy loss per pulse	I_C =50A, V_{CE} = 600V, L_S =20 nH	T_{vj} = 25°C		4.5		mJ
	V_{GE} = +15/-15V, di/dt =570A/µs	T_{vj} = 125°C				mJ
	R_{Gon} = 15Ω	T_{vj} = 150°C				mJ
Turn-off energy loss per pulse	I_C = 50A, V_{CE} = 600V, L_S = 20nH	T_{vj} = 25°C		3.2		mJ
	V_{GE} =+15/-15V, dv/dt =5400V/µs	T_{vj} = 125°C				mJ
	R_{Goff} = 15Ω	T_{vj} = 150°C				mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 25°C , R_G =10Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	I_{SC}		340		A

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Thermal resistance, junction to case	per IGBT, grease = 1.3 W/(m·K)	$R_{th,JC}$			0.589	K/W

Diode, Inverter

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1200		V
Continuous DC forward current		I_F	50		A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}	100		A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F	2.0	2.4	2.5	V
	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 125°C					V
	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 150°C			1.8		V
Peak reverse recovery current	I_F = 50A, V_R = 600V	T_{vj} = 25°C	I_{RM}		50		A
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Recovered charge	I_F = 50A, V_R = 600V	T_{vj} = 25°C	Q_r		5.5		μC
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Reverse recovery energy	I_F = 50A, V_R = 600V	T_{vj} = 25°C	E_{rec}		1.5		mJ
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Thermal resistance, junction to case	Per diode, grease = 1.3 W/(m·K)		$R_{th,JC}$			0.69	K/W

Diode, Rectifier

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1600	V
Average Rectified Output current	V_F = 1.2, T_{vj} = 150°C	I_F	50	A
Surge forward current	t_p = 10 ms, Tvj = 150°C	I_{FSM}	320	A
I^2t - value	t_p = 10 ms, Tvj = 150°C	I^2t	510	A^2s

Characteristic value

			min.	typ.	max.	
Forward voltage	T_{vj} = 150°C, I_F = 50 A	V_F		1.2		V
Reverse current	T_{vj} = 150°C, V_R = 1600 V	I_R		1		mA
Thermal resistance, junction to case	per Diode	R_{thJC}			0.74	K/W
Thermal resistance, junction to heatsink	per Diode, λ grease = 1.3 W/(m·K)	R_{thJH}				K/W

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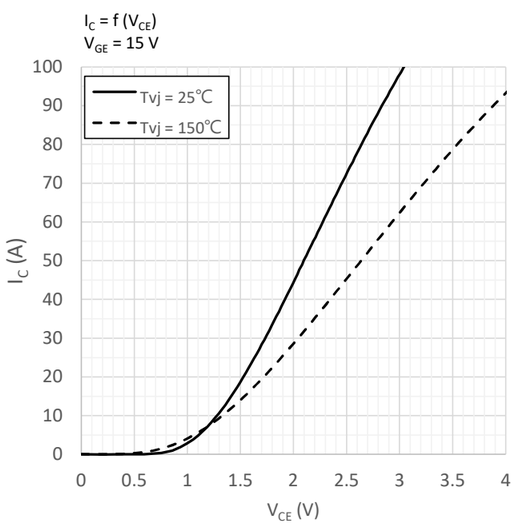
NTC-Thermistor

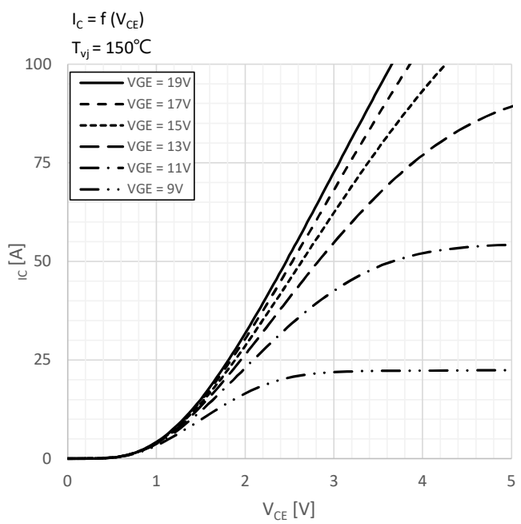
Characteristic value

			min.	typ.	max.	
Rated resistance	Tc = 25°C	R_{25}		5.07		KΩ
Power dissipation	Tc = 25°C	P_{25}			240	mW
B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298, 15K))]$	B_{25}/B_{50}		3412.7		K
B-value	$R_2=R_{25}\exp[B_{25/75}(1/T_2-1/(298, 15K))]$	B_{25}/B_{75}		3454.8		K
B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298, 15K))]$	B_{25}/B_{100}		3442.2		K

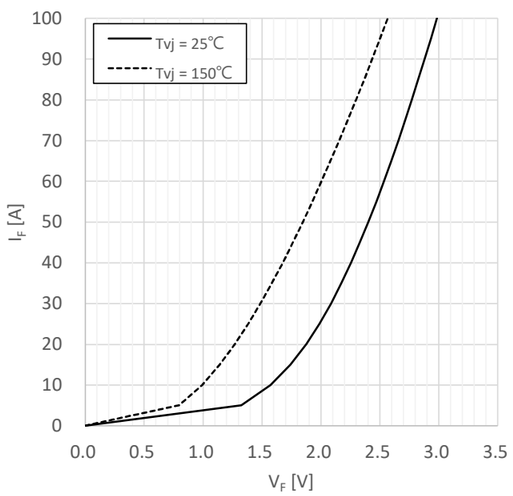
Output characteristic IGBT, Inverter (typical)



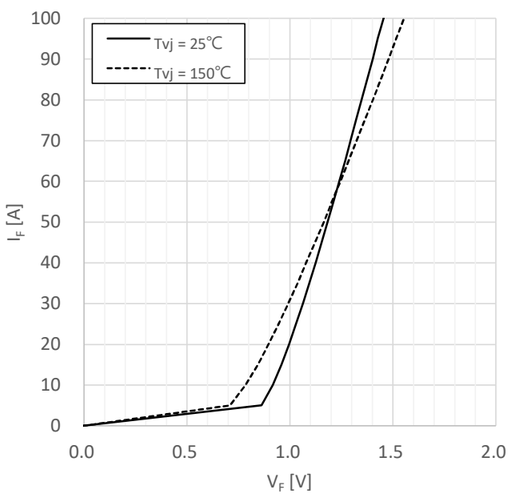
Output characteristic IGBT, Inverter (typical)



Forward characteristic of Diode, Inverter (typical)
$I_F = f(V_F)$



Forward characteristic of Diode, Rectifier (typical)
$I_F = f(V_F)$



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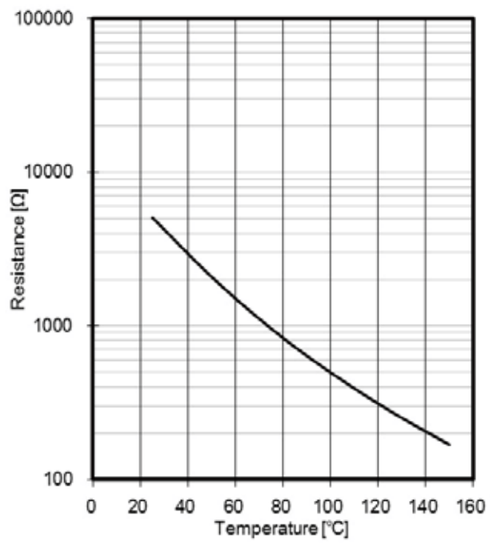
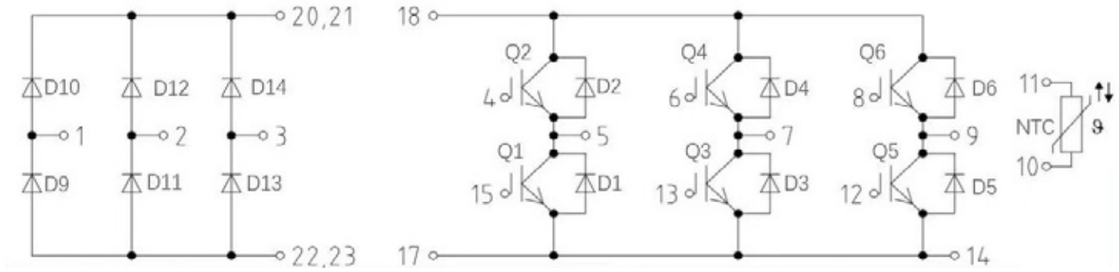
NTC-Thermistor-temperature characteristic (typical) R=f(T)

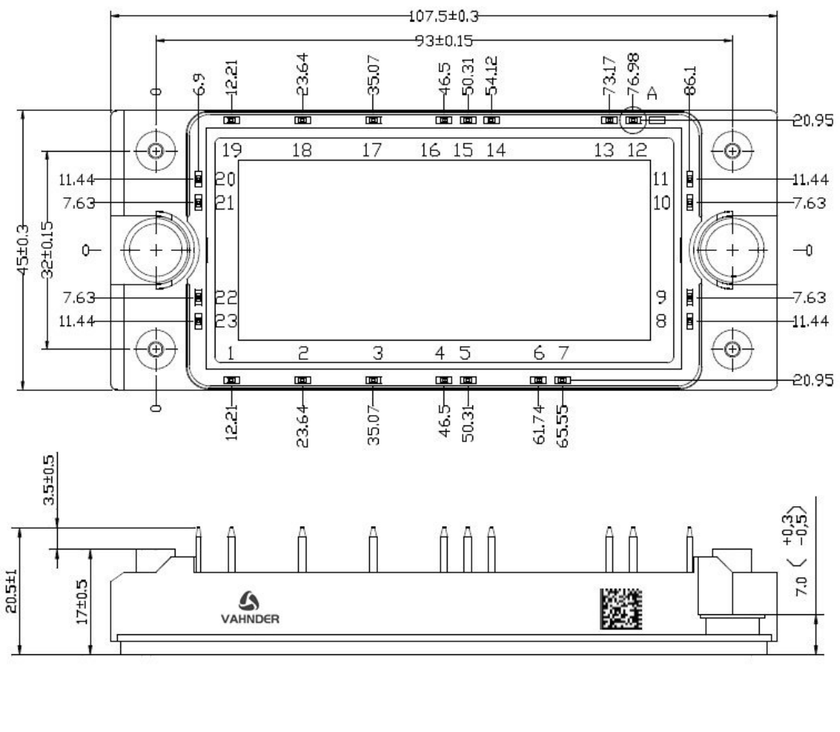


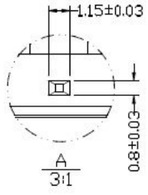
NIETZ	MG050PB120N0

Circuit Diagram



Package outlines





NIETZ	MG075PA120K0

IGBT, Brake-Chopper

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200		V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	50		A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	100		A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}	235		W
Gate-emitter peak voltage		V_{GES}	+/- 20		V

Characteristic value

			min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$		2.10		V
	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 125°C			2.52		V
	I_C = 50 A, V_{GE} = 15 V	T_{vj} = 150°C			2.64		V
Gate threshold voltage	I_C = 1mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.3	5.8	6.3	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G		0.47		µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}		2.2		Ω
Input capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V		C_{ies}		0.62		nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V		C_{res}		0.08		nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Turn-on delay time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C			0.11		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	$T_{d,on}$		0.12		us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C			0.12		us
Rise time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C			0.04		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	T_r		0.05		us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C			0.05		us
Turn-off delay time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C			0.20		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	$T_{d,off}$		0.22		us
	R_{Goff} = 15Ω	T_{vj} = 150°C			0.26		us
Fall time, inductive load	I_C = 50A, V_{CE} = 600V	T_{vj} = 25°C			0.15		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	T_f		0.32		us
	R_{Goff} = 15Ω	T_{vj} = 150°C			0.36		us
Turn-on energy loss per pulse	I_C =50A, V_{CE} = 600V, L_S =20 nH	T_{vj} = 25°C			6.38		mJ
	V_{GE} = +15/-15V,	T_{vj} = 125°C	E_{on}		8.86		mJ
	R_{Gon} = 15Ω	T_{vj} = 150°C			11.28		mJ
Turn-off energy loss per pulse	I_C = 50A, V_{CE} = 600V, L_S = 20nH	T_{vj} = 25°C			3.89		mJ
	V_{GE} =+15/-15V,	T_{vj} = 125°C	E_{off}		4.68		mJ
	R_{Goff} = 15Ω	T_{vj} = 150°C			6.18		mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 150°C , R_G =10Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt		I_{SC}		200		A

Thermal resistance, junction to case	Per IGBT	$R_{th,JC}$			0.53	K/W

Diode, Brake-Chopper

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C		V_{RRM}		1200	V
Continuous DC forward current			I_F		50	A
Repetitive peak forward current	t_P = 1 ms		I_{FRM}		100	A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F		1.42		V
	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 125°C			1.45		V
	I_F = 50 A, V_{GE} = 0 V	T_{vj} = 150°C			1.43		V
Peak reverse recovery current	I_F = 50A, V_R = 600V	T_{vj} = 25°C	I_{RM}		38.6		A
	V_{GE} = -15V	T_{vj} = 125°C			41.1		
		T_{vj} = 150°C			41.9		
Recovered charge	I_F = 50A, V_R = 600V	T_{vj} = 25°C	Q_r		7.46		μC
	V_{GE} = -15V	T_{vj} = 125°C			12.9		
		T_{vj} = 150°C			14.5		
Reverse recovery energy	I_F = 50A, V_R = 600V	T_{vj} = 25°C	E_{rec}		2.09		mJ
	V_{GE} = -15V	T_{vj} = 125°C			4.30		
		T_{vj} = 150°C			4.31		
Thermal resistance, junction to case	Per diode		$R_{th,JC}$			0.69	K/W

NTC-Thermistor

Characteristic value

			min.	typ.	max.	
Rated resistance	Tc = 25°C	R_{25}		5.07		KΩ
Power dissipation	Tc = 25°C	P_{25}			240	mW
B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298, 15K))]$	B_{25}/B_{50}		3412.7		K
B-value	$R_2=R_{25}\exp[B_{25/75}(1/T_2-1/(298, 15K))]$	B_{25}/B_{75}		3454.8		K
B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298, 15K))]$	B_{25}/B_{100}		3442.2		K

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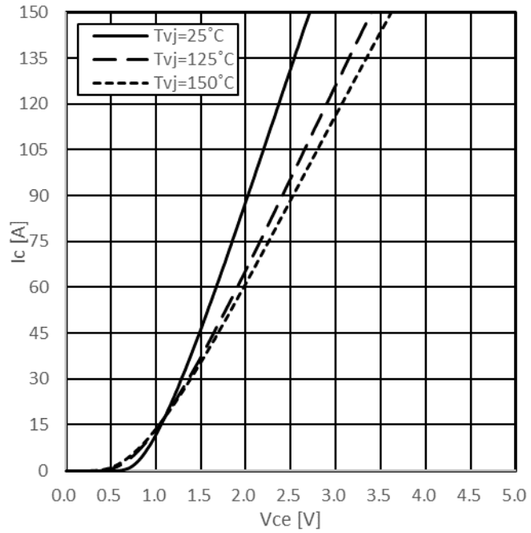
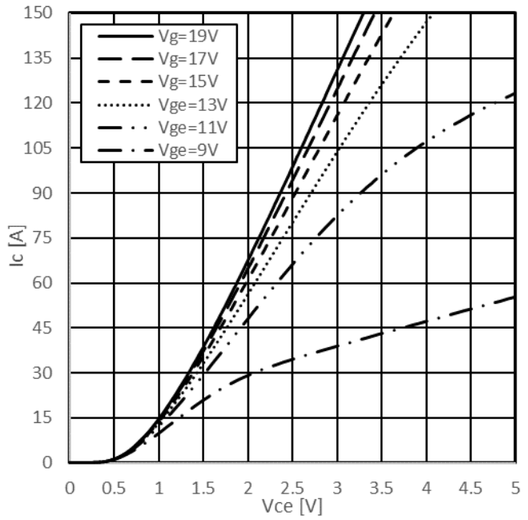
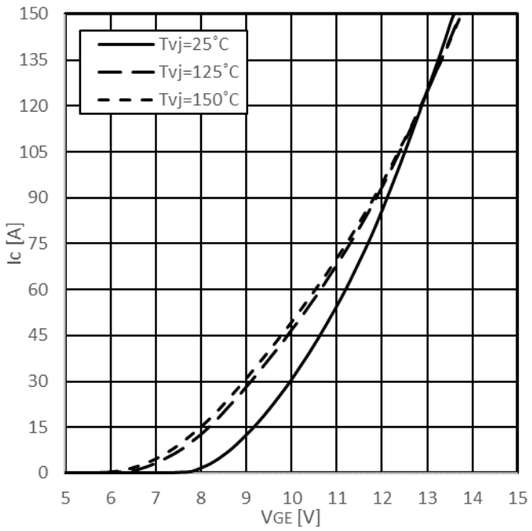
Output characteristic IGBT, Inverter (typical)
Ic=f(VCE)
VGE=15V



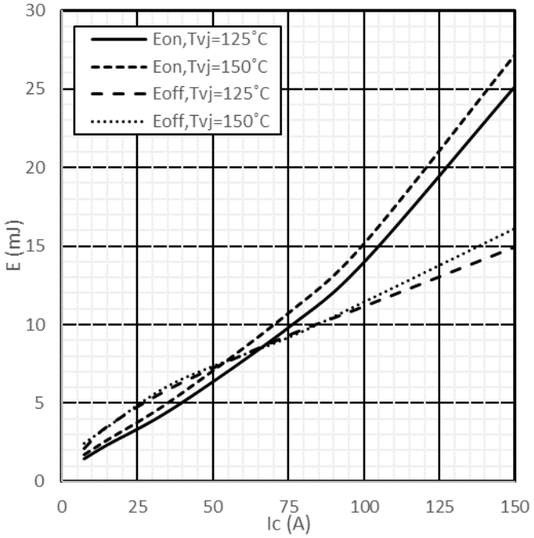
Output characteristic IGBT, Inverter (typical)
Ic=f(VCE)
Tvj=150˚C



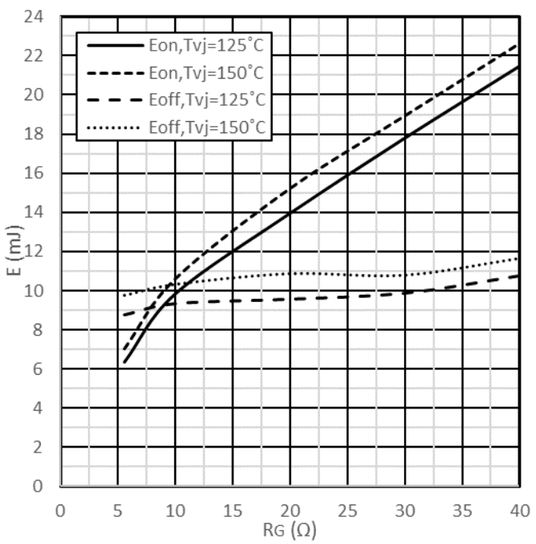
Transfer characteristic IGBT,Inverter (typical)
Ic=f(VGE)
VCE=20V



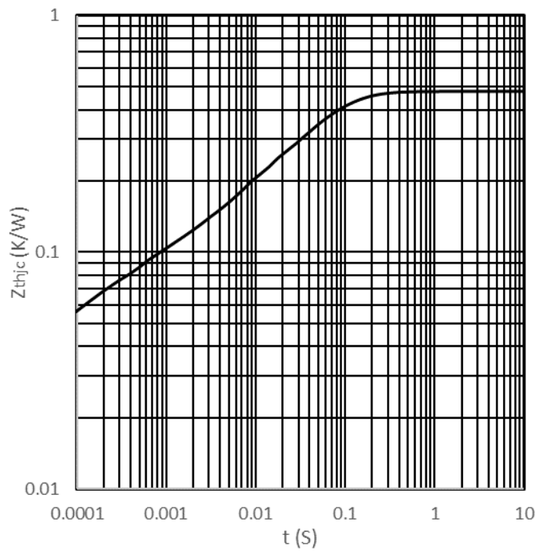
Switching losses IGBT,Inverter (typical)
Eon = f (IC), Eoff = f (IC)
VGE = ±15 V, RGon = 10Ω, RGoff = 10Ω, VCE = 600 V



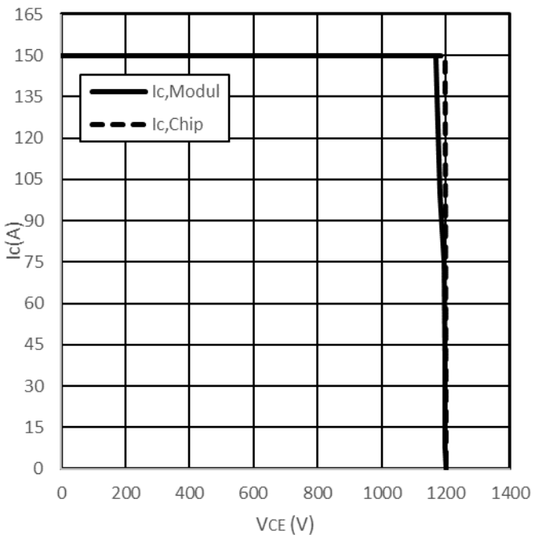
Switching losses IGBT,Inverter (typical)
Eon = f (RG), Eoff = f (RG)
VGE = ±15 V, Ic=75A, VCE = 600 V



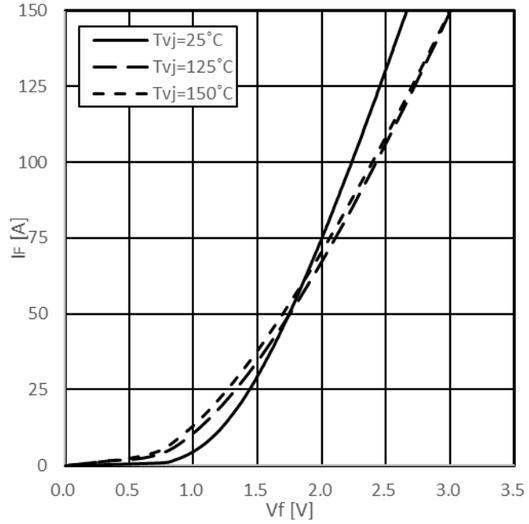
Transient thermal impedance IGBT,Inverter
ZthJC = f (t)



Reverse bias safe operating area IGBT,Inverter (RBSOA)
IC = f (VCE)
VGE = ±15 V, RGoff =10Ω, Tvj = 150°C



Forward characteristic of Diode, Inverter (typical)
IF = f (VF)



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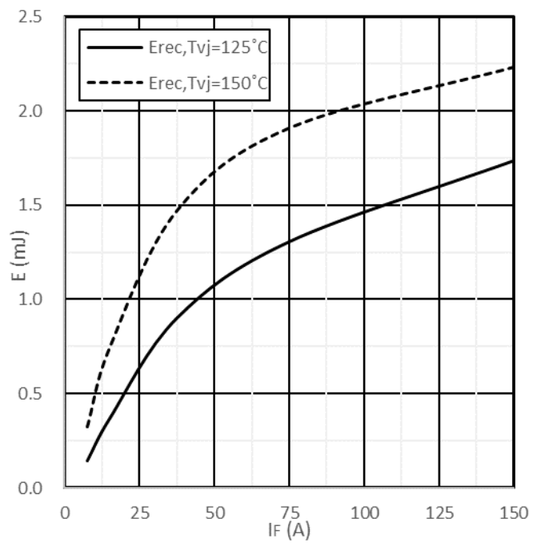
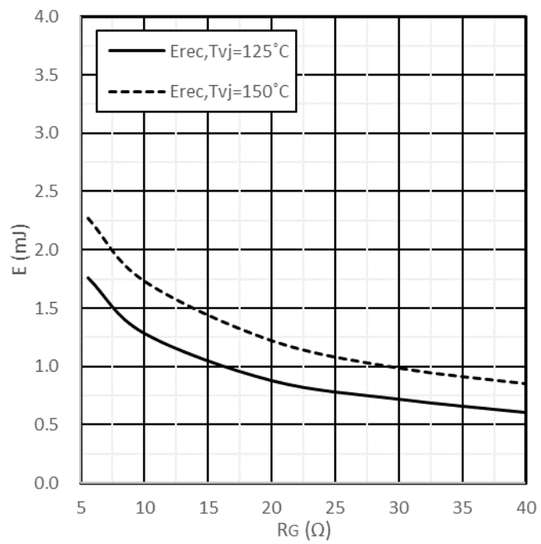
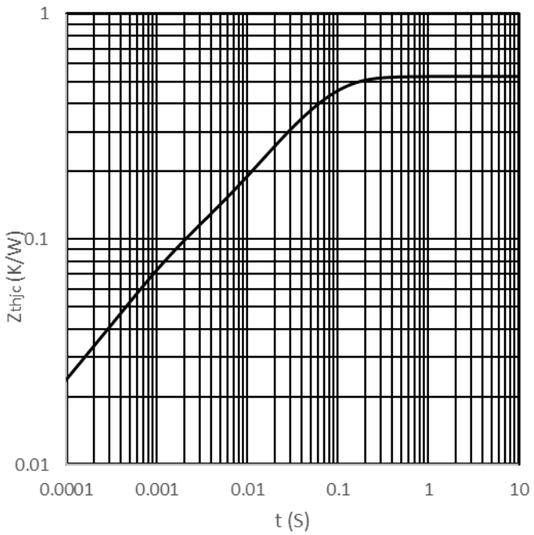
Switching losses Diode, Inverter (typical)
Erec = f (IF)
RGon = 10Ω, VCE = 600 V



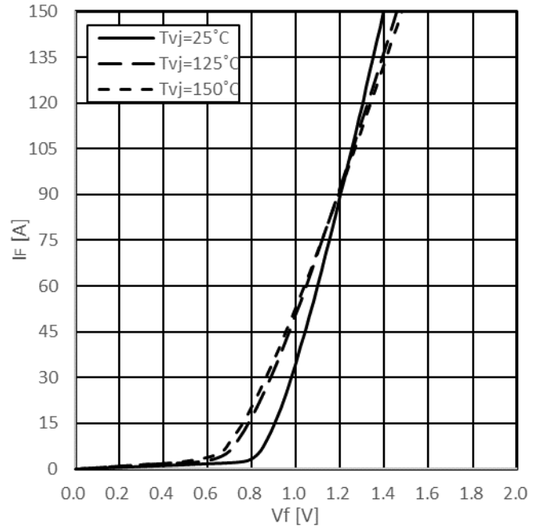
Switching losses Diode, Inverter (typical)
Erec = f (RG)
IF = 75 A, VCE = 600 V



Transient thermal impedance Diode, Inverter
ZthJC = f (t)



Forward characteristic of Diode, Rectifier (typical)
$I_F = f(V_F)$



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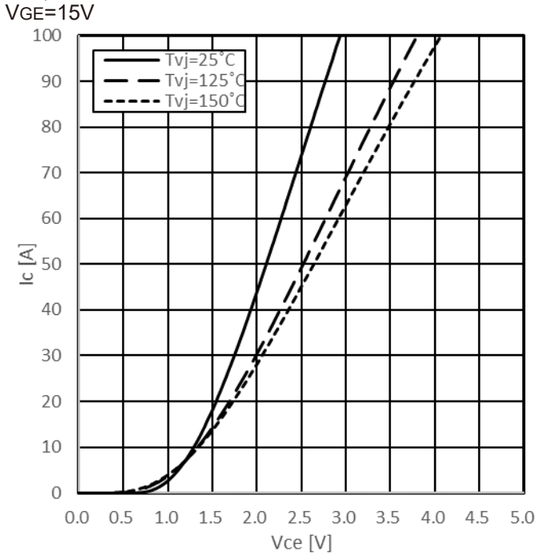
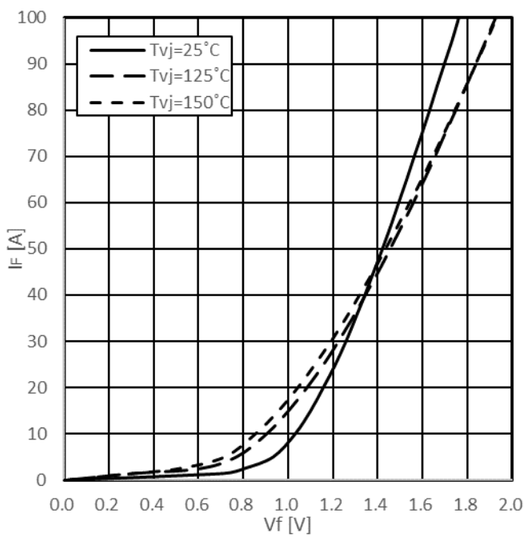
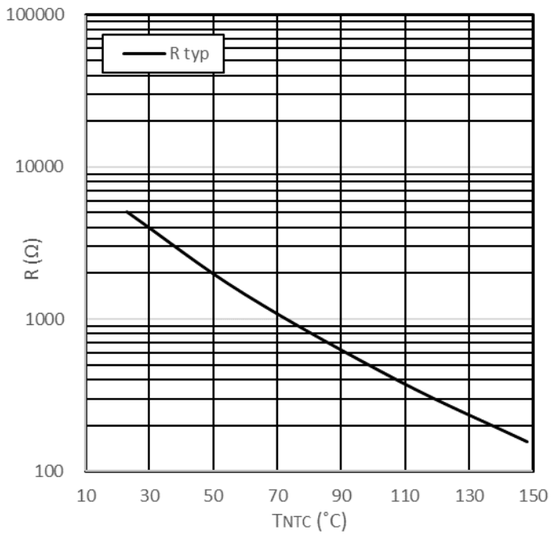
Output characteristic IGBT, Brake-Chopper (typical)
$I_C=f(V_{CE})$
$V_{GE}=15V$



Forward characteristic of Diode, Brake-Chopper (typical)
$I_F = f(V_F)$



NTC-Thermistor-temperature characteristic (typical)
R=f(T)



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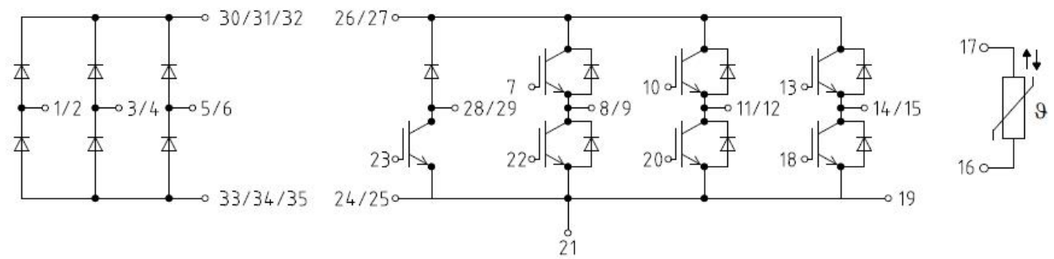
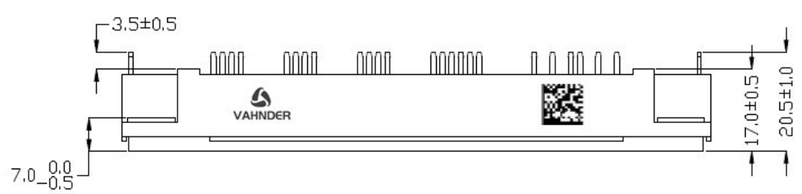
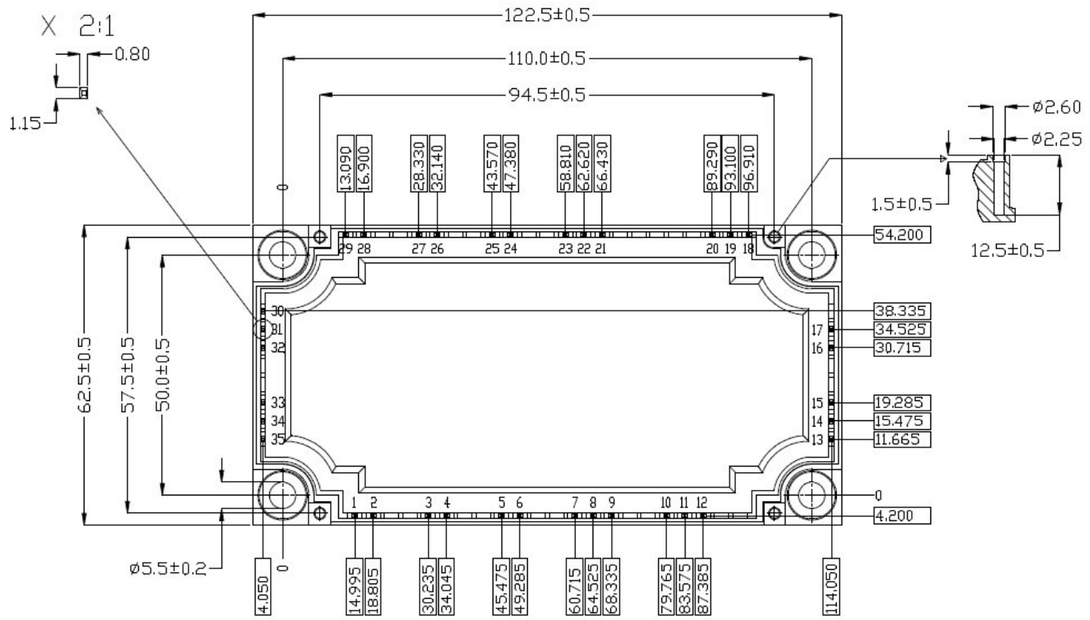
Circuit Diagram



Package outlines





MG075PB120K0

1200V75A EconoPIM3 IGBT Module

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IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200		V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	75		A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	150		A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}	258		W
Gate-emitter peak voltage		V_{GES}	+/- 20		V

Characteristic value

			min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 75 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$		1.85		V
	I_C = 75 A, V_{GE} = 15 V	T_{vj} = 125°C			2.15		V
	I_C = 75 A, V_{GE} = 15 V	T_{vj} = 150°C			2.26		V
Gate threshold voltage	I_C = 2.8mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.0	6.0	6.5	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G		0.81		µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}		2.7		Ω
Input capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{ies}		9.80		nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{res}		0.12		nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Turn-on delay time, inductive load	I_C = 75A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,on}$		0.17		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.18		us
	$R_{G,on}$ = 10Ω	T_{vj} = 150°C			0.18		us
Rise time, inductive load	I_C = 75A, V_{CE} = 600V	T_{vj} = 25°C	T_r		0.05		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.06		us
	$R_{G,on}$ = 10Ω	T_{vj} = 150°C			0.07		us
Turn-off delay time, inductive load	I_C = 75A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,off}$		0.34		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.39		us
	R_{Goff} = 10Ω	T_{vj} = 150°C			0.40		us
Fall time, inductive load	I_C = 75A, V_{CE} = 600V	T_{vj} = 25°C	T_f		0.15		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.19		us
	R_{Goff} = 10Ω	T_{vj} = 150°C			0.38		us
Turn-on energy loss per pulse	I_C =75A, V_{CE} = 600V, L_S =35 nH	T_{vj} = 25°C	E_{on}		7.06		mJ
	V_{GE} = +15/-15V, di/dt =1100A/µs	T_{vj} = 125°C			9.82		mJ
	R_{Gon} = 10Ω	T_{vj} = 150°C			10.6		mJ
Turn-off energy loss per pulse	I_C = 75A, V_{CE} = 600V, L_S = 35nH	T_{vj} = 25°C	E_{off}		7.19		mJ
	V_{GE} =+15/-15V, dv/dt =4040V/µs	T_{vj} = 125°C			9.35		mJ

	R_{Goff} = 10Ω T_{vj} = 150°C			10.3		mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 150°C , R_G =10Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	I_{SC}		450		A
Thermal resistance, junction to case	Per IGBT	$R_{th,JC}$			0.48	K/W

Diode, Inverter

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1200		V
Continuous DC forward current		I_F	75		A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}	150		A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 75 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F		1.99		V
	I_F = 75 A, V_{GE} = 0 V	T_{vj} = 125°C			2.10		V
	I_F = 75 A, V_{GE} = 0 V	T_{vj} = 150°C			2.05		V
Peak reverse recovery current	I_F = 75A, V_R = 600V	T_{vj} = 25°C	I_{RM}		50.2		A
	V_{GE} = -15V	T_{vj} = 125°C			53.5		
		T_{vj} = 150°C			56.1		
Recovered charge	I_F = 75A, V_R = 600V	T_{vj} = 25°C	Q_r		3.01		µC
	V_{GE} = -15V	T_{vj} = 125°C			6.96		
		T_{vj} = 150°C			8.50		
Reverse recovery energy	I_F = 75A, V_R = 600V	T_{vj} = 25°C	E_{rec}		0.14		mJ
	V_{GE} = -15V	T_{vj} = 125°C			1.28		
		T_{vj} = 150°C			1.71		
Thermal resistance, junction to case	Per diode		$R_{th,JC}$			0.53	K/W

Diode, Rectifier

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1600	V
Average Rectified Output current	V_F = 1.2, T_{vj} = 150°C	I_F	75	A
Surge forward current	t_p = 10 ms, Tvj = 150°C	I_{FSM}	515	A
I^2t - value	t_p = 10 ms, Tvj = 150°C	I^2t	1330	A^2s

Characteristic value

			min.	typ.	max.	
Forward voltage	T_{vj} = 150°C, I_F = 75 A	V_F		1.11		V
Reverse current	T_{vj} = 150°C, V_R = 1600 V	I_R		1		mA
Thermal resistance, junction to case	per Diode	R_{thJC}			0.55	K/W

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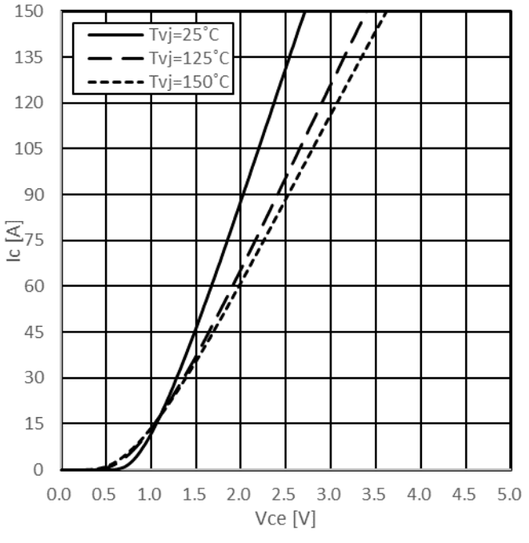
NTC-Thermistor

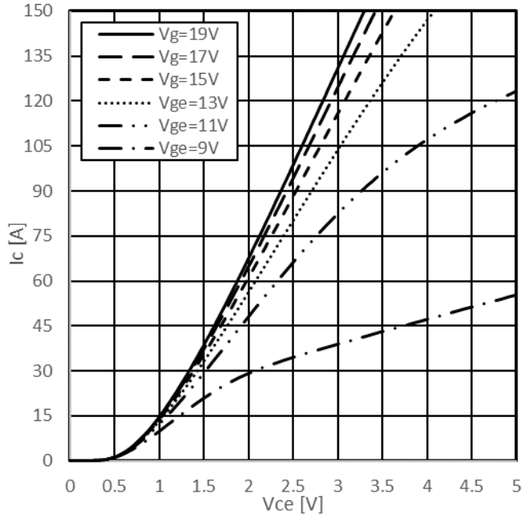
Characteristic value

			min.	typ.	max.	
Rated resistance	Tc = 25°C	R_{25}		5.07		KΩ
Power dissipation	Tc = 25°C	P_{25}			240	mW
B-value	$R_2=R_{25}exp[B_{25/50}(1/T_2-1/(298, 15K))]$	B_{25}/B_{50}		3412.7		K
B-value	$R_2=R_{25}exp[B_{25/75}(1/T_2-1/(298, 15K))]$	B_{25}/B_{75}		3454.8		K
B-value	$R_2=R_{25}exp[B_{25/100}(1/T_2-1/(298, 15K))]$	B_{25}/B_{100}		3442.2		K

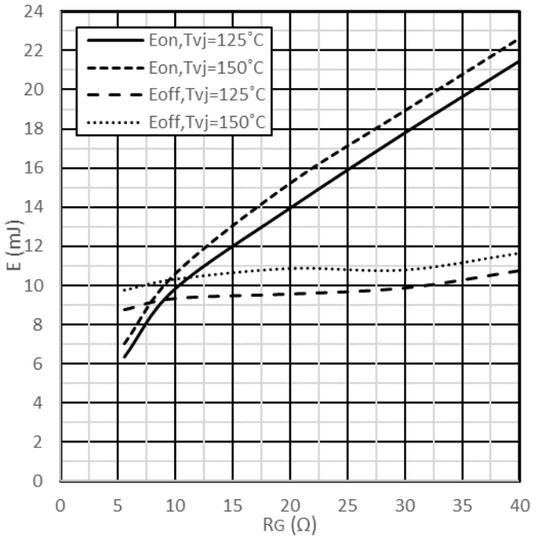
Output characteristic IGBT, Inverter (typical)
Ic=f(VCE)
VGE=15V



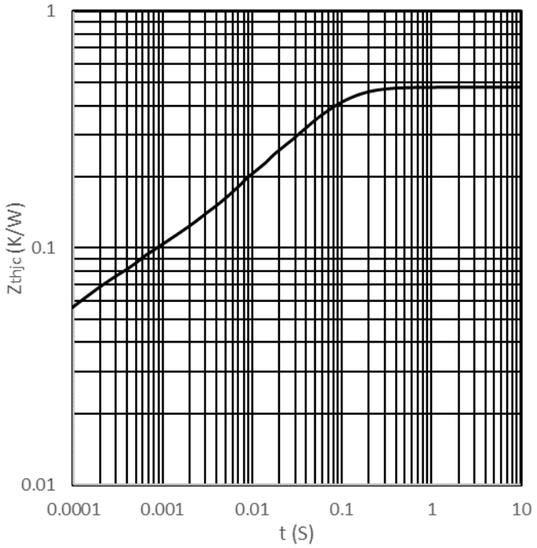
Output characteristic IGBT, Inverter (typical)
Ic=f(VCE)
Tvj=150˚C



Switching losses IGBT,Inverter (typical)
Eon = f (RG), Eoff = f (RG)
VGE = ±15 V, Ic=75A, VCE = 600 V



Transient thermal impedance IGBT,Inverter
ZthJC = f (t)



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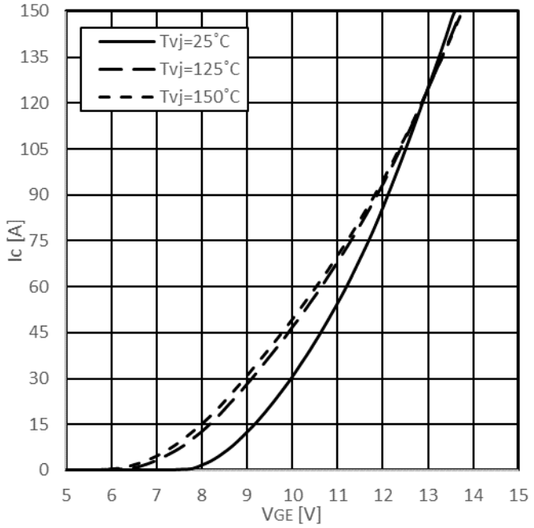
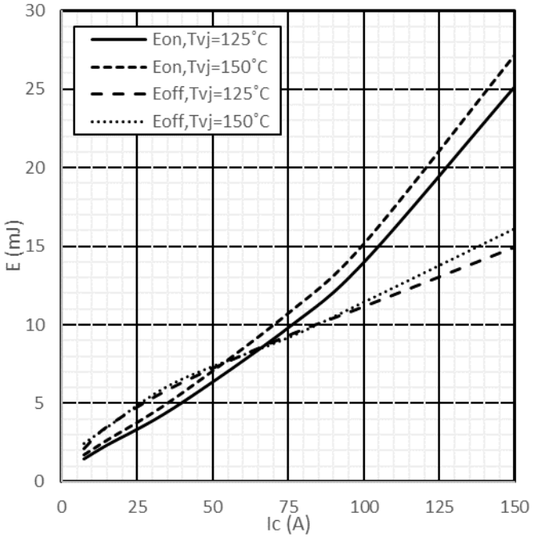
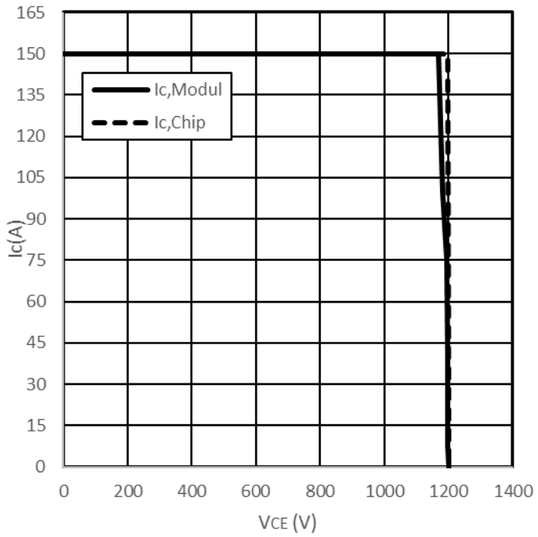
Transfer characteristic IGBT,Inverter (typical)
Ic=f(VGE)
VCE=20V



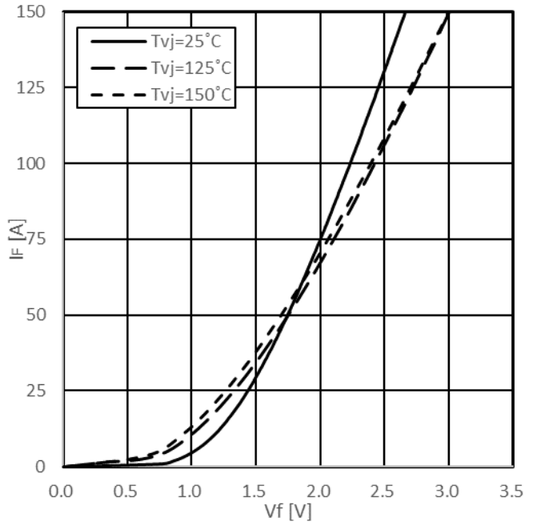
Switching losses IGBT,Inverter (typical)
Eon = f (Ic), Eoff = f (Ic)
VGE = ±15 V, RGon = 10Ω, RGoff = 10Ω, VCE = 600 V



Reverse bias safe operating area IGBT,Inverter (RBSOA)
IC = f (VCE)
VGE = ±15 V, RGoff =10Ω, Tvj = 150°C



Forward characteristic of Diode, Inverter (typical)
IF = f (VF)



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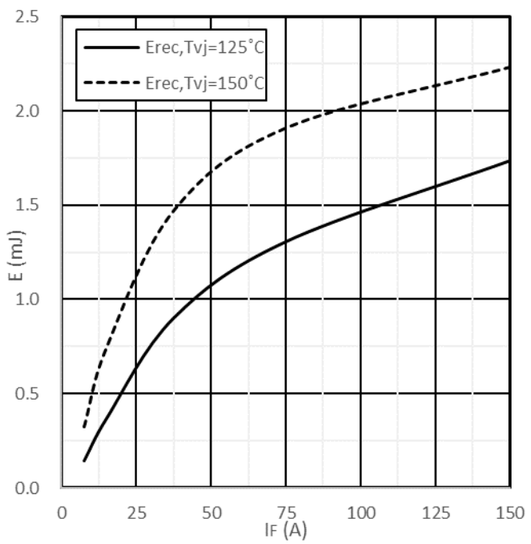
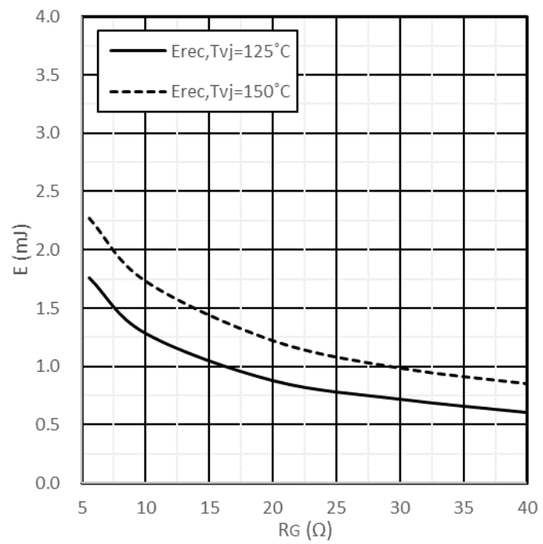
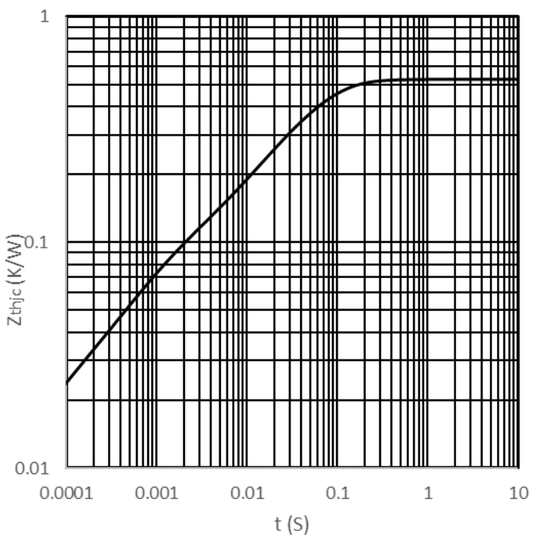
Switching losses Diode, Inverter (typical)
Erec = f (IF)
RGon = 10Ω, VCE = 600 V



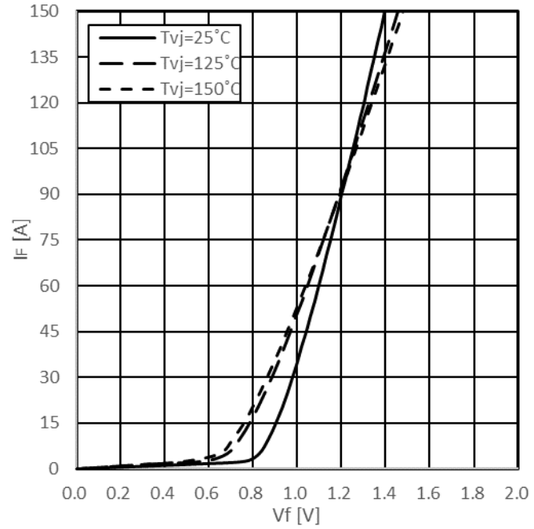
Switching losses Diode, Inverter (typical)
Erec = f (RG)
IF = 75 A, VCE = 600 V



Transient thermal impedance Diode, Inverter
ZthJC = f (t)



Forward characteristic of Diode, Rectifier (typical)
$I_F = f(V_F)$



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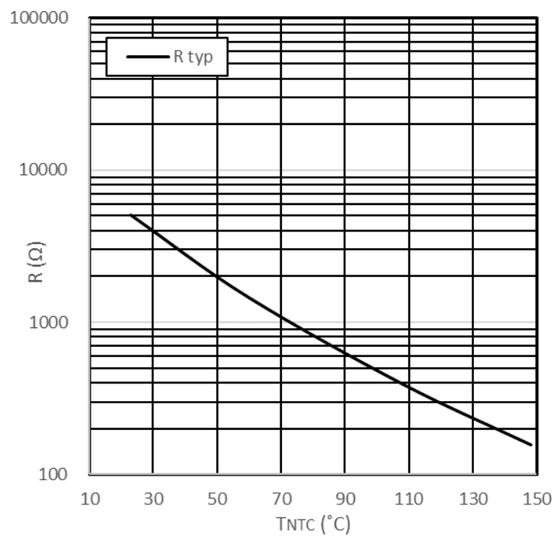
NTC-Thermistor-temperature characteristic (typical)
R=f(T)



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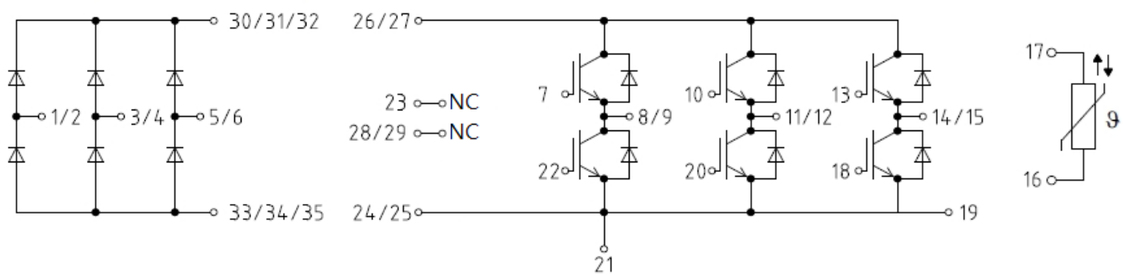
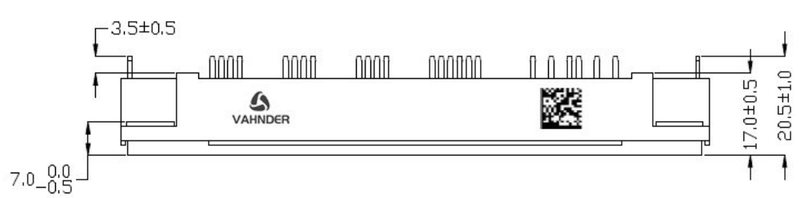
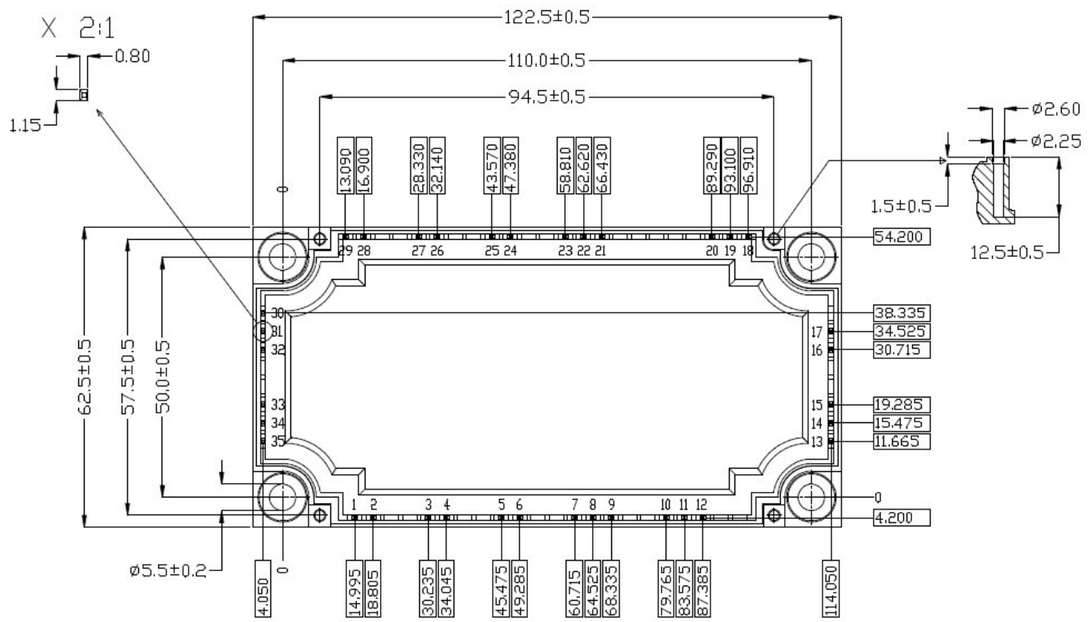
Circuit Diagram



Package outlines





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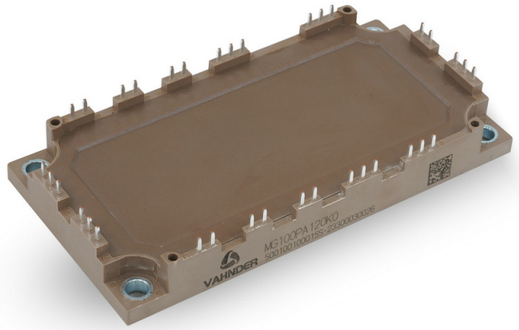

MG100PA120K0

1200V100A EconoPIM3 IGBT Module

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IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200		V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	100		A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	200		A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}	480		W
Gate-emitter peak voltage		V_{GES}	+/- 20		V

Characteristic value

				min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 100 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$		2.35		V
	I_C = 100 A, V_{GE} = 15 V	T_{vj} = 125°C			2.85		V
	I_C = 100 A, V_{GE} = 15 V	T_{vj} = 150°C			2.99		V
Gate threshold voltage	I_C = 1.0mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.0	5.5	6.0	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G		0.98		µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}		3.0		Ω
Input capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{ies}		27.6		nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{res}				nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Turn-on delay time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,on}$		0.16		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.18		us
	$R_{G,on}$ = 6.8Ω	T_{vj} = 150°C			0.21		us
Rise time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C	T_r		0.05		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.06		us
	$R_{G,on}$ = 6.8Ω	T_{vj} = 150°C			0.08		us
Turn-off delay time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,off}$		0.32		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.34		us
	R_{Goff} = 6.8Ω	T_{vj} = 150°C			0.35		us
Fall time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C	T_f		0.12		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.12		us
	R_{Goff} = 6.8Ω	T_{vj} = 150°C			0.12		us
Turn-on energy loss per pulse	I_C =100A, V_{CE} = 600V, L_S =20 nH	T_{vj} = 25°C	E_{on}		8.81		mJ
	V_{GE} = +15/-15V, di/dt =1300A/µs	T_{vj} = 125°C			14.1		mJ
	R_{Gon} = 6.8Ω, Tj=150°C	T_{vj} = 150°C			18.4		mJ
Turn-off energy loss per pulse	I_C = 100A, V_{CE} = 600V, L_S = 20nH	T_{vj} = 25°C	E_{off}		9.36		mJ
	V_{GE} =+15/-15V, dv/dt =5900V/µs	T_{vj} = 125°C			9.00		mJ

	R_{Goff} = 6.8Ω, Tj=150°C T_{vj} = 150°C			10.3		mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 25°C , R_G =10Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} · di/dt	I_{SC}		810		A
Thermal resistance, junction to case	Per IGBT	$R_{th,JC}$			0.26	K/W

Diode, Inverter

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}		1200		V
Continuous DC forward current		I_F		100		A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}		200		A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 100 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F		2.16		V
	I_F = 100 A, V_{GE} = 0 V	T_{vj} = 125°C			2.01		V
	I_F = 100 A, V_{GE} = 0 V	T_{vj} = 150°C			1.96		V
Peak reverse recovery current	I_F = 100A, V_R = 600V	T_{vj} = 25°C	I_{RM}		81.9		A
	V_{GE} = -15V, -dif/dt =470A/µs	T_{vj} = 125°C			112.6		
	R_{Goff} = 6.8Ω, Tj=150°C	T_{vj} = 150°C			117.5		
Recovered charge	I_F = 100A, V_R = 600V	T_{vj} = 25°C	Q_r		5.75		µC
	V_{GE} = -15V, -dif/dt =470A/µs	T_{vj} = 125°C			18.8		
	R_{Goff} = 6.8Ω, Tj=150°C	T_{vj} = 150°C			22.4		
Reverse recovery energy	I_F = 100A, V_R = 600V	T_{vj} = 25°C	E_{rec}		1.29		mJ
	V_{GE} = -15V, -dif /dt =470A/µs	T_{vj} = 125°C			3.67		
	R_{Goff} = 6.8Ω, Tj=150°C	T_{vj} = 150°C			4.61		
Thermal resistance, junction to case	Per Diode		$R_{th,JC}$			0.44	K/W

Diode, Rectifier

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1600		V
Average Rectified Output current	V_F = 1.2, T_{vj} = 150°C	I_F	100		A
Surge forward current	t_p = 10 ms, Tvj = 150°C	I_{FSM}	990		A
I^2t - value	t_p = 10 ms, Tvj = 150°C	I^2t	4950		A^2s

Characteristic value

			min.	typ.	max.	
Forward voltage	T_{vj} = 150°C, I_F = 100 A	V_F		1.15		V
Reverse current	T_{vj} = 150°C, V_R = 1600 V	I_R		1		mA
Thermal resistance, junction to case	Per Diode	R_{thJC}			0.44	K/W

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IGBT, Brake-Chopper

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}		1200		V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$		75		A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}		150		A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}		265		W
Gate-emitter peak voltage		V_{GES}		+/- 20		V

Characteristic value

				min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 75 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$		1.74		V
	I_C = 75 A, V_{GE} = 15 V	T_{vj} = 125°C			2.15		V
	I_C = 75 A, V_{GE} = 15 V	T_{vj} = 150°C			2.23		V
Gate threshold voltage	I_C = 2.8mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.0	5.8	6.5	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G		0.8		µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}		2.7		Ω
Input capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V		C_{ies}		9.80		nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V		C_{res}		0.12		nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Turn-on delay time, inductive load	I_C = 75A, V_{CE} = 600V	T_{vj} = 25°C			0.18		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	$T_{d,on}$		0.19		us
	$R_{G,on}$ = 10Ω	T_{vj} = 150°C			0.19		us
Rise time, inductive load	I_C = 75A, V_{CE} = 600V	T_{vj} = 25°C			0.06		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	T_r		0.07		us
	$R_{G,on}$ = 10Ω	T_{vj} = 150°C			0.07		us
Turn-off delay time, inductive load	I_C = 75A, V_{CE} = 600V	T_{vj} = 25°C			0.37		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	$T_{d,off}$		0.41		us
	R_{Goff} = 10Ω	T_{vj} = 150°C			0.42		us
Fall time, inductive load	I_C = 75A, V_{CE} = 600V	T_{vj} = 25°C			0.26		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	T_f		0.36		us
	R_{Goff} = 10Ω	T_{vj} = 150°C			0.44		us
Turn-on energy loss per pulse	I_C =75A, V_{CE} = 600V, L_S =20 nH	T_{vj} = 25°C			9.97		mJ
	V_{GE} = +15/-15V, di/dt =825A/µs	T_{vj} = 125°C	E_{on}		13.72		mJ
	R_{Gon} = 10Ω, Tj=150°C	T_{vj} = 150°C			14.73		mJ

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Turn-off energy loss per pulse	I_C =75A, V_{CE} = 600V, L_S =20 nH	T_{vj} = 25°C	E_{off}		7.80		mJ
	V_{GE} = +15/-15V, dv/dt =4300V/µs	T_{vj} = 125°C			10.1		mJ
	R_{Gon} = 10Ω, Tj=150°C	T_{vj} = 150°C			10.6		mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 25°C , R_G =10Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt		I_{SC}		322		A
Thermal resistance, junction to case	Per IGBT		$R_{th,JC}$			0.47	K/W

Diode, Brake-Chopper

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1200		V
Continuous DC forward current		I_F	75		A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}	150		A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 75 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F		1.80		V
	I_F = 75 A, V_{GE} = 0 V	T_{vj} = 125°C			1.86		V
	I_F = 75 A, V_{GE} = 0 V	T_{vj} = 150°C			1.81		V
Peak reverse recovery current	I_F = 75A, V_R = 600V	T_{vj} = 25°C	I_{RM}		39.3		A
	V_{GE} = -15V	T_{vj} = 125°C			42.5		
		T_{vj} = 150°C			52.2		
Recovered charge	I_F = 75A, V_R = 600V	T_{vj} = 25°C	Q_r		1.96		µC
	V_{GE} = -15V, -dif /dt =215A/µs	T_{vj} = 125°C			6.31		
	R_{Goff} = 10Ω, Tj=150°C	T_{vj} = 150°C			8.86		
Reverse recovery energy	I_F = 75A, V_R = 600V	T_{vj} = 25°C	E_{rec}		0.30		mJ
	V_{GE} = -15V, -dif /dt =215A/µs	T_{vj} = 125°C			1.05		
	R_{Goff} = 10Ω, Tj=150°C	T_{vj} = 150°C			1.36		
Thermal resistance, junction to case	Per Diode		$R_{th,JC}$			0.56	K/W

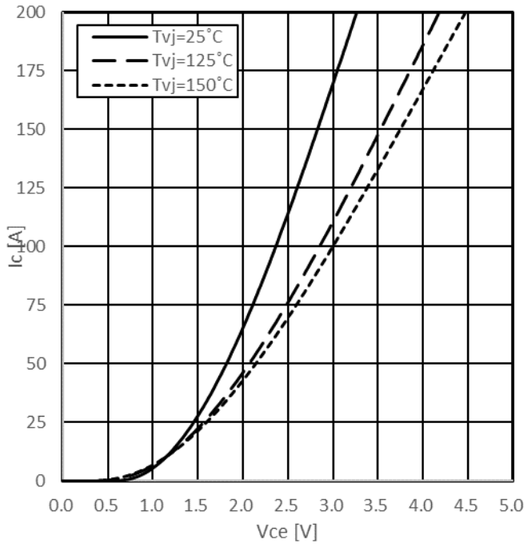
NTC-Thermistor

Characteristic value

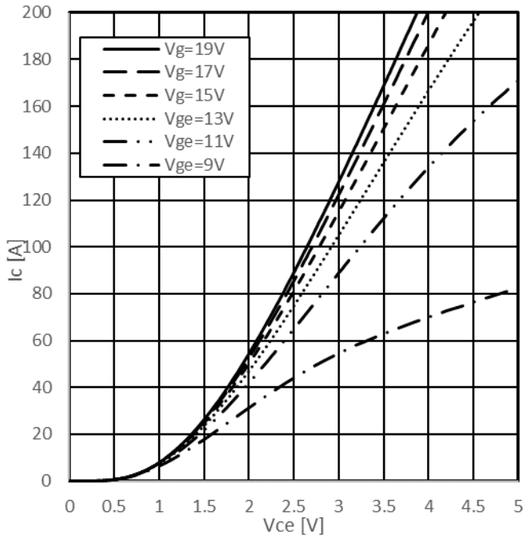
			min.	typ.	max.	
Rated resistance	Tc = 25°C	R_{25}		5.07		KΩ
Power dissipation	Tc = 25°C	P_{25}			240	mW
B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298, 15K))]$	B_{25}/B_{50}		3412.7		K
B-value	$R_2=R_{25}\exp[B_{25/75}(1/T_2-1/(298, 15K))]$	B_{25}/B_{75}		3454.8		K
B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298, 15K))]$	B_{25}/B_{100}		3442.2		K

NIETZ MG100PA120K0

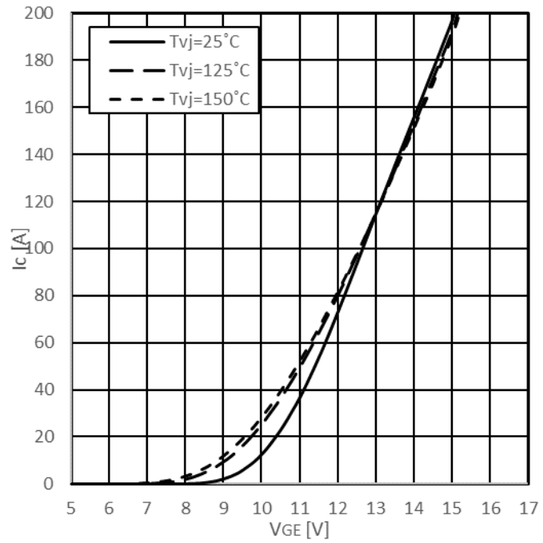
Output characteristic IGBT, Inverter (typical)
Ic=f(VCE)
VGE=15V



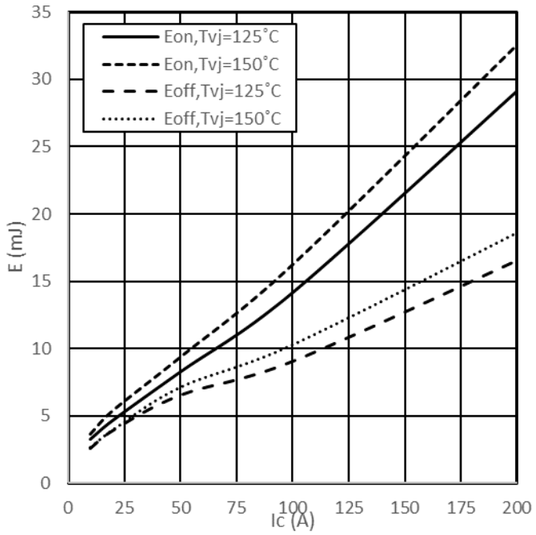
Output characteristic IGBT, Inverter (typical)
Ic=f(VCE)
Tvj=150˚C



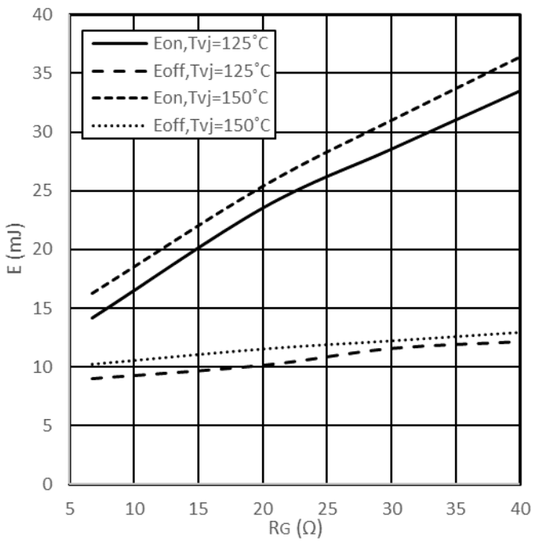
Transfer characteristic IGBT,Inverter (typical)
Ic=f(VGE)
VCE=20V



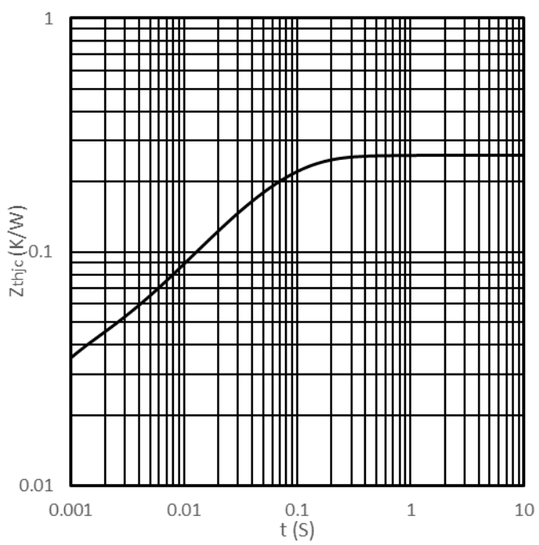
Switching losses IGBT,Inverter (typical)
Eon = f (IC), Eoff = f (IC)
VGE = ±15 V, RGon = 6.8Ω, RGoff = 10Ω, VCE = 600 V



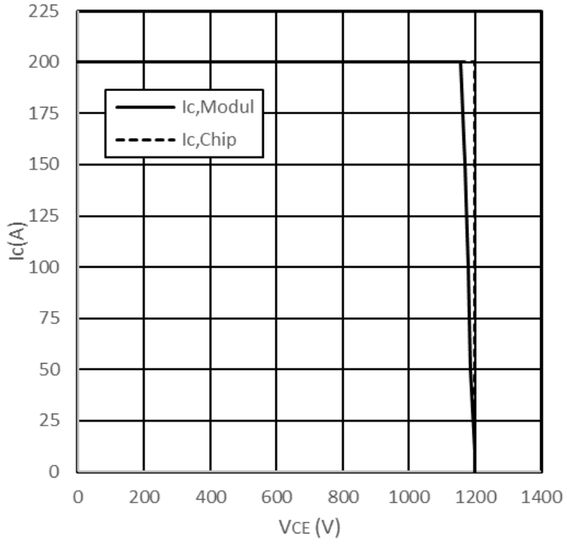
Switching losses IGBT,Inverter (typical)
Eon = f (RG), Eoff = f (RG)
VGE = ±15 V, Ic=75A, VCE = 600 V



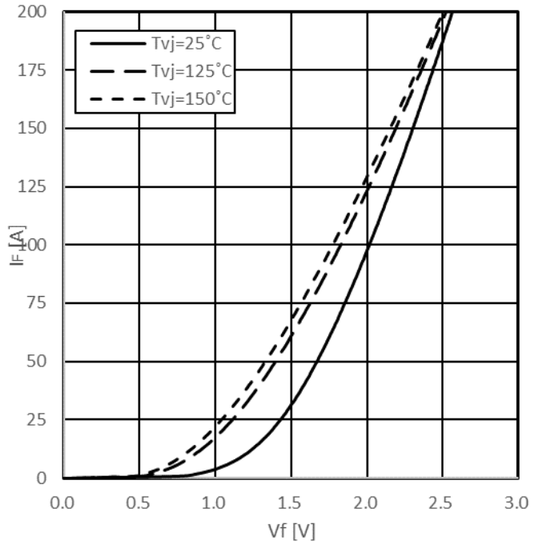
Transient thermal impedance IGBT,Inverter
ZthJC = f (t)



Reverse bias safe operating area IGBT,Inverter (RBSOA)
IC = f (VCE)
VGE = ±15 V, RGoff =10Ω, Tvj = 150°C

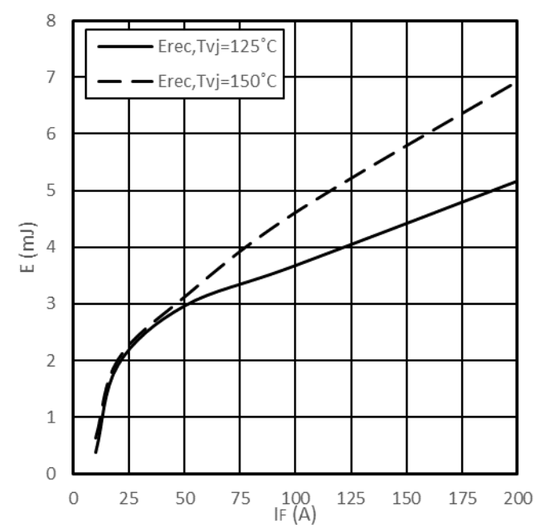


Forward characteristic of Diode, Inverter (typical)
IF = f (VF)

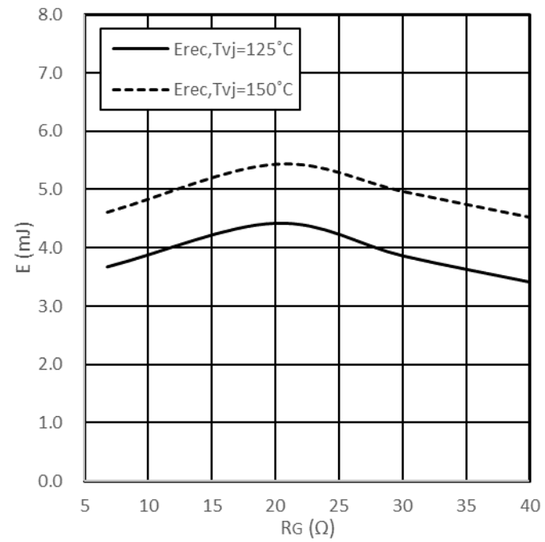


NIETZ MG100PA120K0

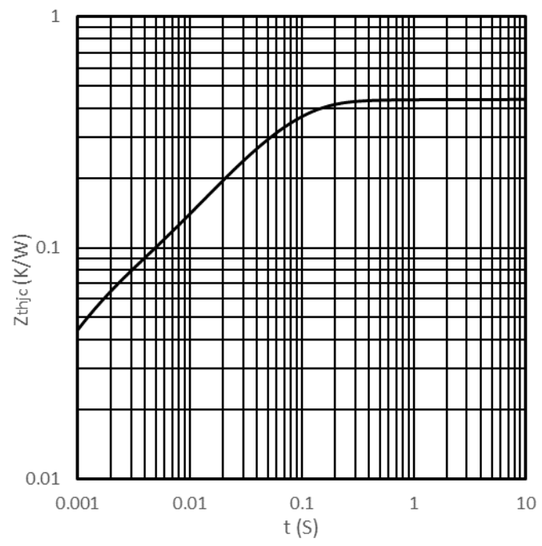
Switching losses Diode, Inverter (typical)
Erec = f (IF)
RGon = 6.8Ω, VCE = 600 V



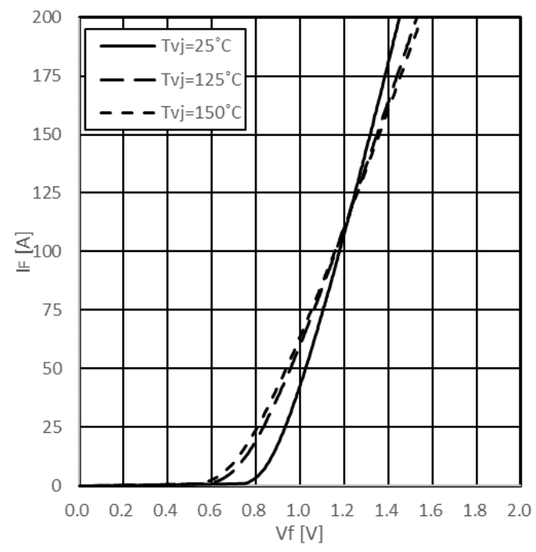
Switching losses Diode, Inverter (typical)
Erec = f (RG)
IF = 100 A, VCE = 600 V



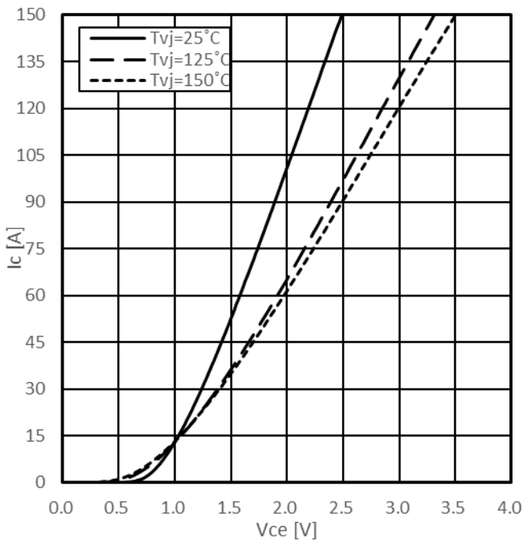
Transient thermal impedance Diode, Inverter
ZthJC = f (t)



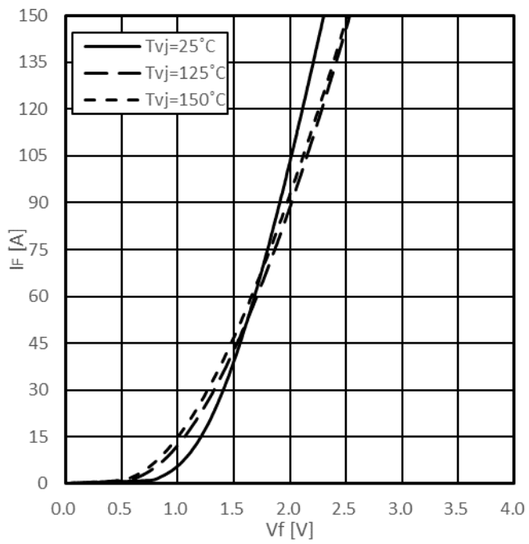
Forward characteristic of Diode, Rectifier (typical)
IF = f(VF)



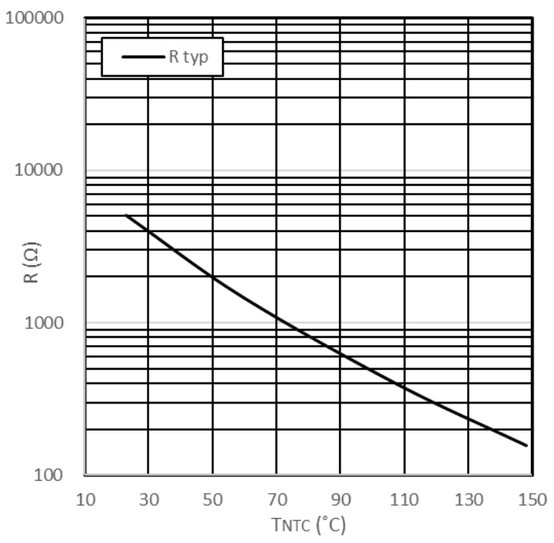
Output characteristic IGBT, Brake-Chopper (typical)
Ic=f(VCE)
VGE=15V



Forward characteristic of Diode, Brake-Chopper (typical)
IF = f(VF)



NTC-Thermistor-temperature characteristic (typical)
R=f(T)



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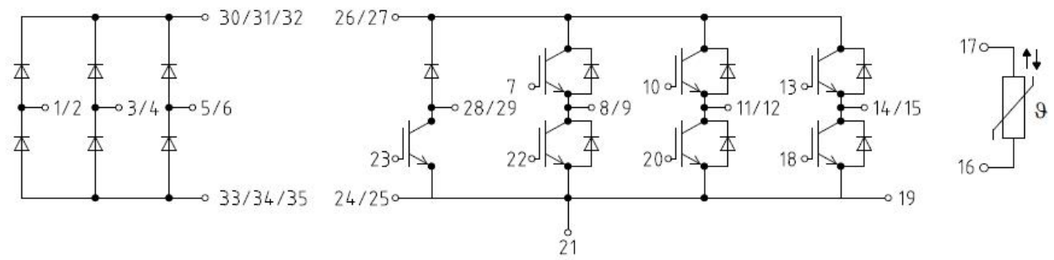
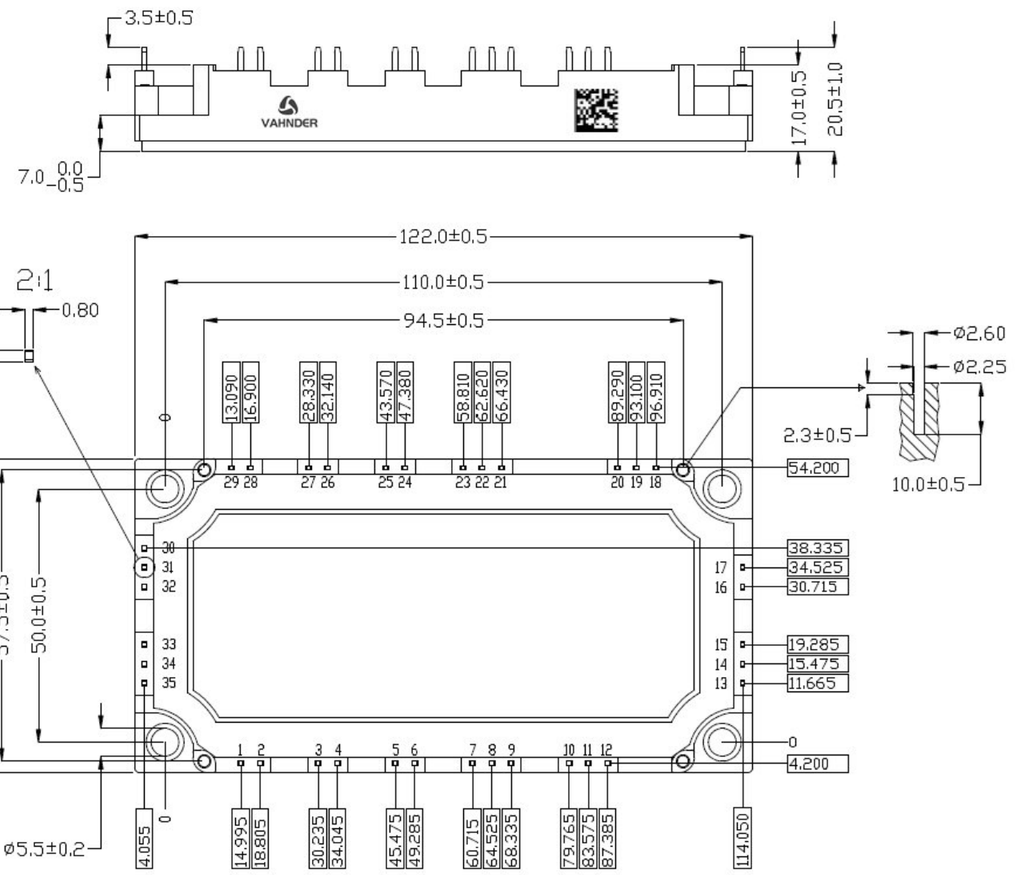
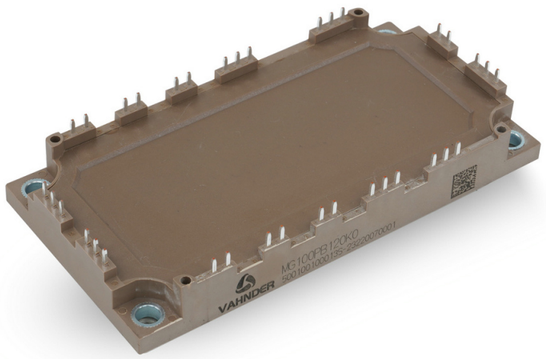
Circuit Diagram



Package outlines





MG100PB120K0

1200V100A EconoPIM3 IGBT Module

NIETZ | MG100PB120K0

IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200		V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	100		A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	200		A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}	480		W
Gate-emitter peak voltage		V_{GES}	+/- 20		V

Characteristic value

			min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 100 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$		2.35		V
	I_C = 100 A, V_{GE} = 15 V	T_{vj} = 125°C			2.85		V
	I_C = 100 A, V_{GE} = 15 V	T_{vj} = 150°C			2.99		V
Gate threshold voltage	I_C = 1.0mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.0	5.5	6.0	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G		0.98		µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}		3.0		Ω
Input capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{ies}		27.6		nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{res}				nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Turn-on delay time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,on}$		0.16		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.18		us
	$R_{G,on}$ = 6.8Ω	T_{vj} = 150°C			0.21		us
Rise time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C	T_r		0.05		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.06		us
	$R_{G,on}$ = 6.8Ω	T_{vj} = 150°C			0.08		us
Turn-off delay time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,off}$		0.32		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.34		us
	R_{Goff} = 6.8Ω	T_{vj} = 150°C			0.35		us
Fall time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C	T_f		0.12		us
	V_{GE} = +15/-15V	T_{vj} = 125°C			0.12		us
	R_{Goff} = 6.8Ω	T_{vj} = 150°C			0.12		us
Turn-on energy loss per pulse	I_C =100A, V_{CE} = 600V, L_S =20 nH	T_{vj} = 25°C	E_{on}		8.81		mJ
	V_{GE} = +15/-15V, di/dt =1300A/µs	T_{vj} = 125°C			14.1		mJ
	R_{Gon} = 6.8Ω, Tj=150°C	T_{vj} = 150°C			18.4		mJ
Turn-off energy loss per pulse	I_C = 100A, V_{CE} = 600V, L_S = 20nH	T_{vj} = 25°C	E_{off}		9.36		mJ
	V_{GE} =+15/-15V, dv/dt =5900V/µs	T_{vj} = 125°C			9.00		mJ

	R_{Goff} = 6.8Ω, Tj=150°C T_{vj} = 150°C			10.3		mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 25°C , R_G =10Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} · di/dt	I_{SC}		810		A
Thermal resistance, junction to case	Per IGBT	$R_{th,JC}$			0.26	K/W

Diode, Inverter

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}		1200		V
Continuous DC forward current		I_F		100		A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}		200		A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 100 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F		2.16		V
	I_F = 100 A, V_{GE} = 0 V	T_{vj} = 125°C			2.01		V
	I_F = 100 A, V_{GE} = 0 V	T_{vj} = 150°C			1.96		V
Peak reverse recovery current	I_F = 100A, V_R = 600V	T_{vj} = 25°C	I_{RM}		81.9		A
	V_{GE} = -15V, -dif/dt =470A/µs	T_{vj} = 125°C			112.6		
	R_{Goff} = 6.8Ω, Tj=150°C	T_{vj} = 150°C			117.5		
Recovered charge	I_F = 100A, V_R = 600V	T_{vj} = 25°C	Q_r		5.75		µC
	V_{GE} = -15V, -dif/dt =470A/µs	T_{vj} = 125°C			18.8		
	R_{Goff} = 6.8Ω, Tj=150°C	T_{vj} = 150°C			22.4		
Reverse recovery energy	I_F = 100A, V_R = 600V	T_{vj} = 25°C	E_{rec}		1.29		mJ
	V_{GE} = -15V, -dif /dt =470A/µs	T_{vj} = 125°C			3.67		
	R_{Goff} = 6.8Ω, Tj=150°C	T_{vj} = 150°C			4.61		
Thermal resistance, junction to case	Per Diode		$R_{th,JC}$			0.44	K/W

Diode, Rectifier

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}		1600	V
Average Rectified Output current	V_F = 1.2, T_{vj} = 150°C	I_F		100	A
Surge forward current	t_p = 10 ms, Tvj = 150°C	I_{FSM}		990	A
I^2t - value	t_p = 10 ms, Tvj = 150°C	I^2t		4950	A^2s

Characteristic value

				min.	typ.	max.	
Forward voltage	T_{vj} = 150°C, I_F = 100 A		V_F		1.15		V
Reverse current	T_{vj} = 150°C, V_R = 1600 V		I_R		1		mA
Thermal resistance, junction to case	Per Diode		R_{thJC}			0.44	K/W

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NTC-Thermistor

Characteristic value

			min.	typ.	max.	
Rated resistance	Tc = 25°C	R_{25}		5.07		KΩ
Power dissipation	Tc = 25°C	P_{25}			240	mW
B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298, 15K))]$	B_{25}/B_{50}		3412.7		K
B-value	$R_2=R_{25}\exp[B_{25/75}(1/T_2-1/(298, 15K))]$	B_{25}/B_{75}		3454.8		K
B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298, 15K))]$	B_{25}/B_{100}		3442.2		K

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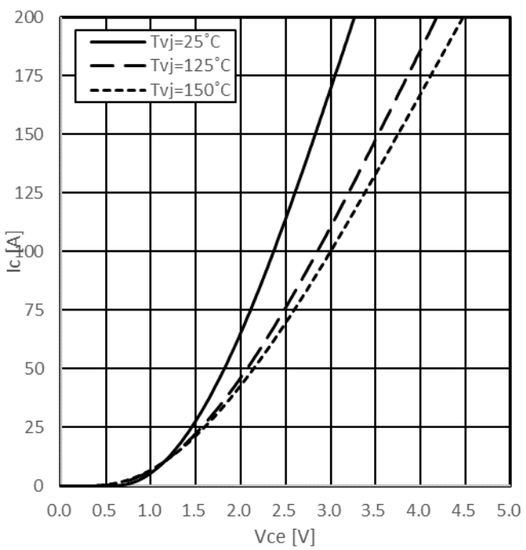
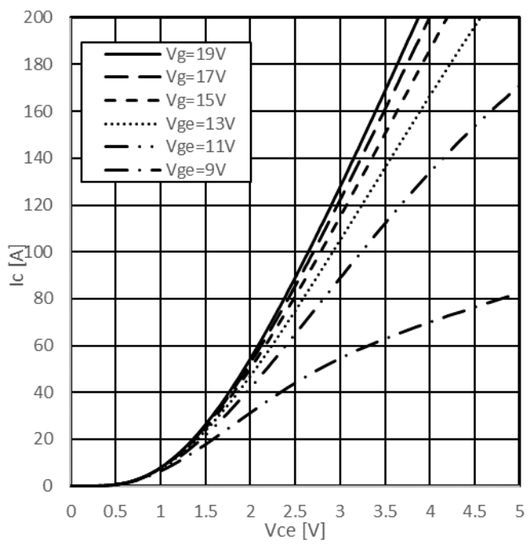
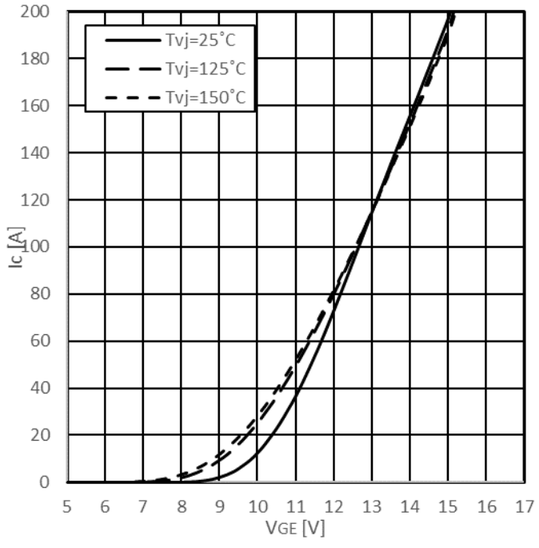
Output characteristic IGBT, Inverter (typical)
Ic=f(VCE)
VGE=15V



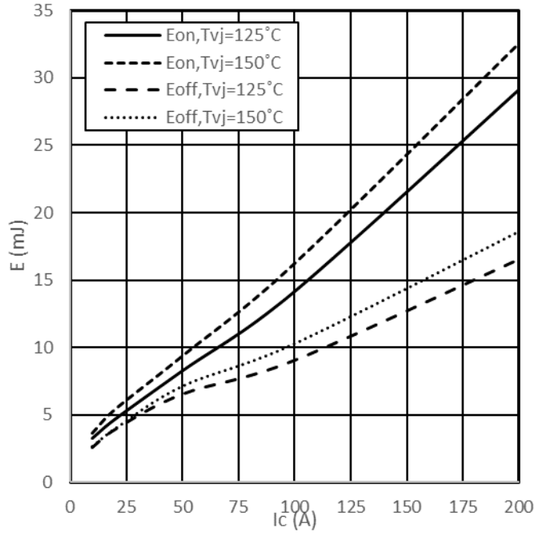
Output characteristic IGBT, Inverter (typical)
Ic=f(VCE)
Tvj=150˚C



Transfer characteristic IGBT,Inverter (typical)
Ic=f(VGE)
VCE=20V



Switching losses IGBT,Inverter (typical)
Eon = f (IC), Eoff = f (IC)
VGE = ±15 V, RGon = 6.8Ω, RGoff = 10Ω, VCE = 600 V



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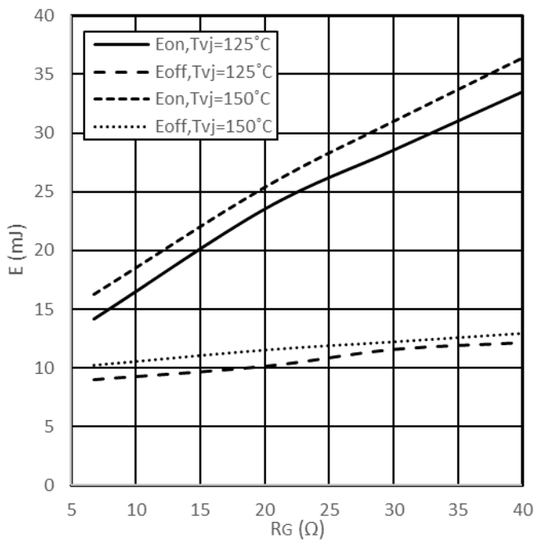
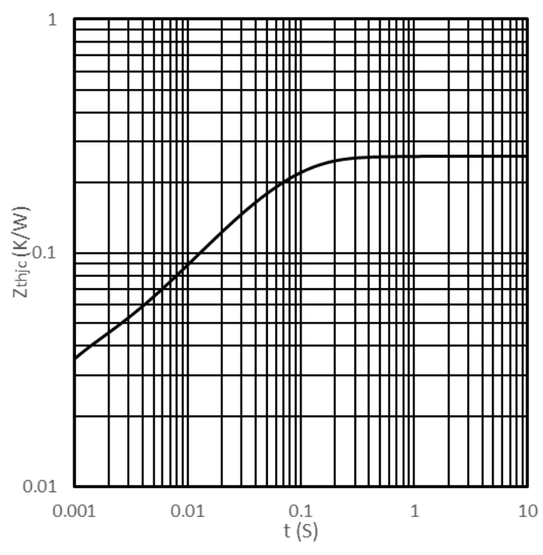
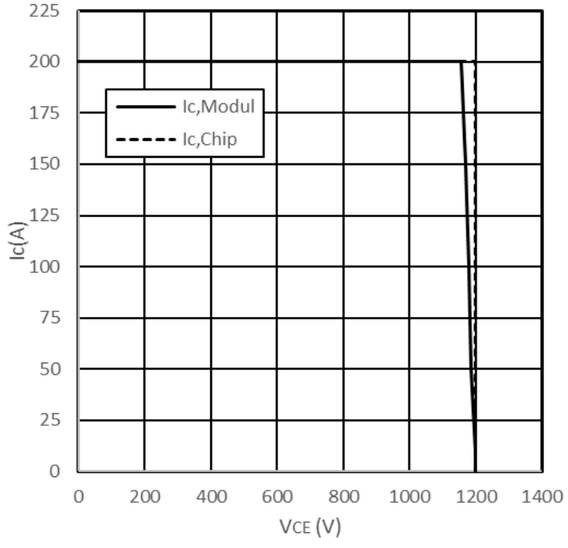
Switching losses IGBT,Inverter (typical)
Eon = f (RG), Eoff = f (RG)
VGE = ±15 V, Ic=75A, VCE = 600 V



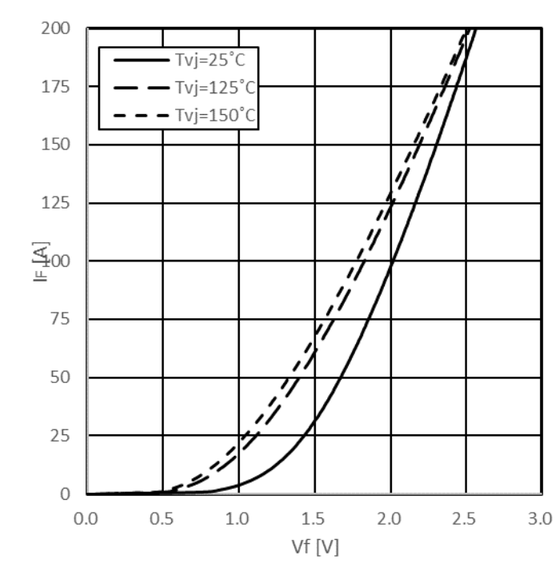
Transient thermal impedance IGBT,Inverter
ZthJC = f (t)



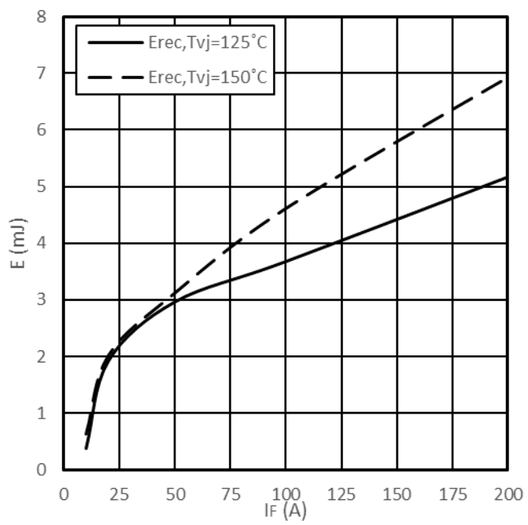
Reverse bias safe operating area IGBT,Inverter (RBSOA)
IC = f (VCE)
VGE = ±15 V, RGoff =10Ω, Tvj = 150°C



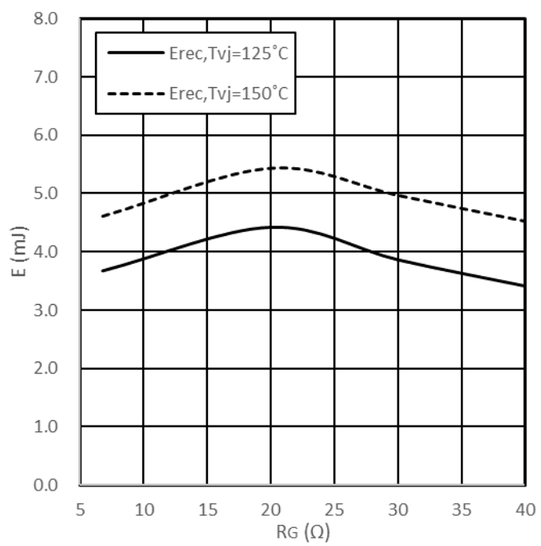
Forward characteristic of Diode, Inverter (typical)
IF = f (VF)



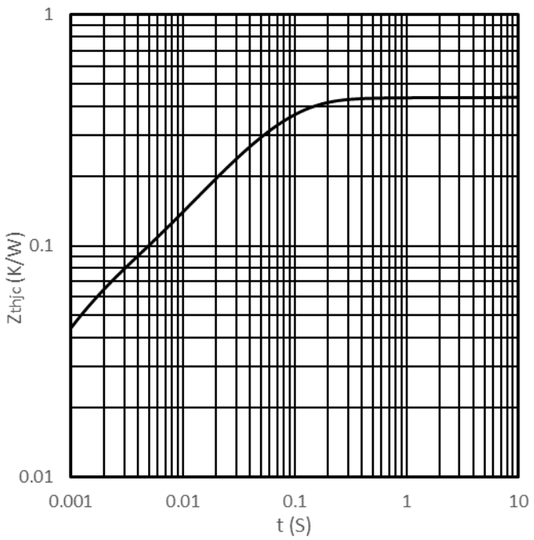
Switching losses Diode, Inverter (typical)
Erec = f (IF)
RGon = 6.8Ω, VCE = 600 V



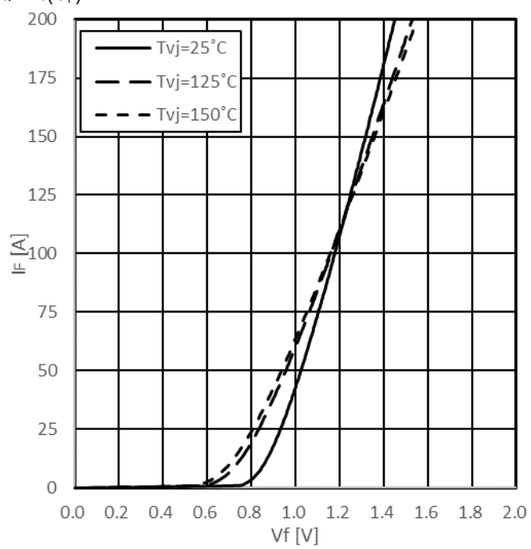
Switching losses Diode, Inverter (typical)
Erec = f (RG)
IF = 100 A, VCE = 600 V



Transient thermal impedance Diode, Inverter
ZthJC = f (t)



Forward characteristic of Diode, Rectifier (typical)
$I_F = f(V_F)$



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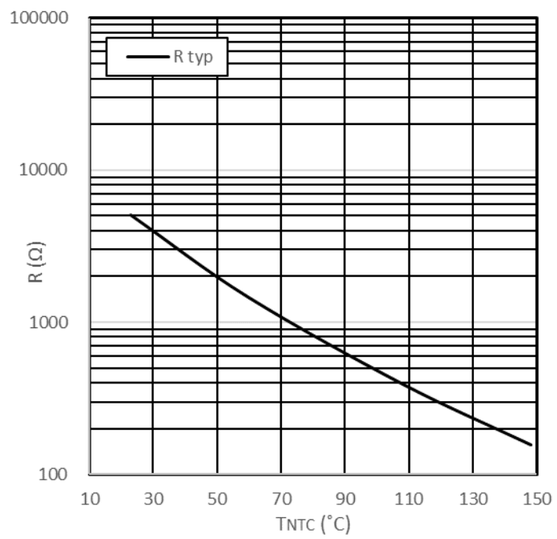
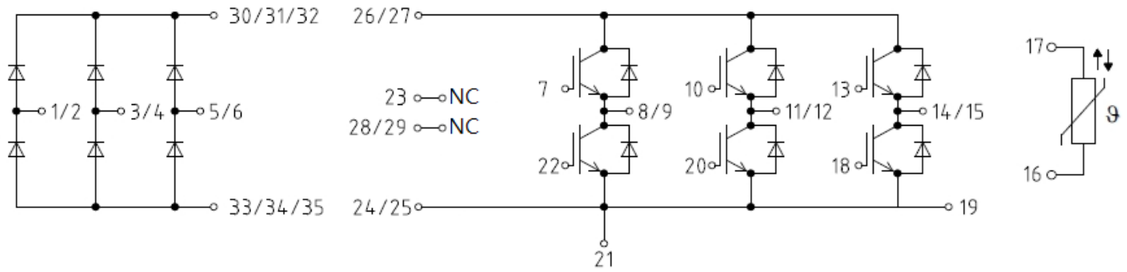
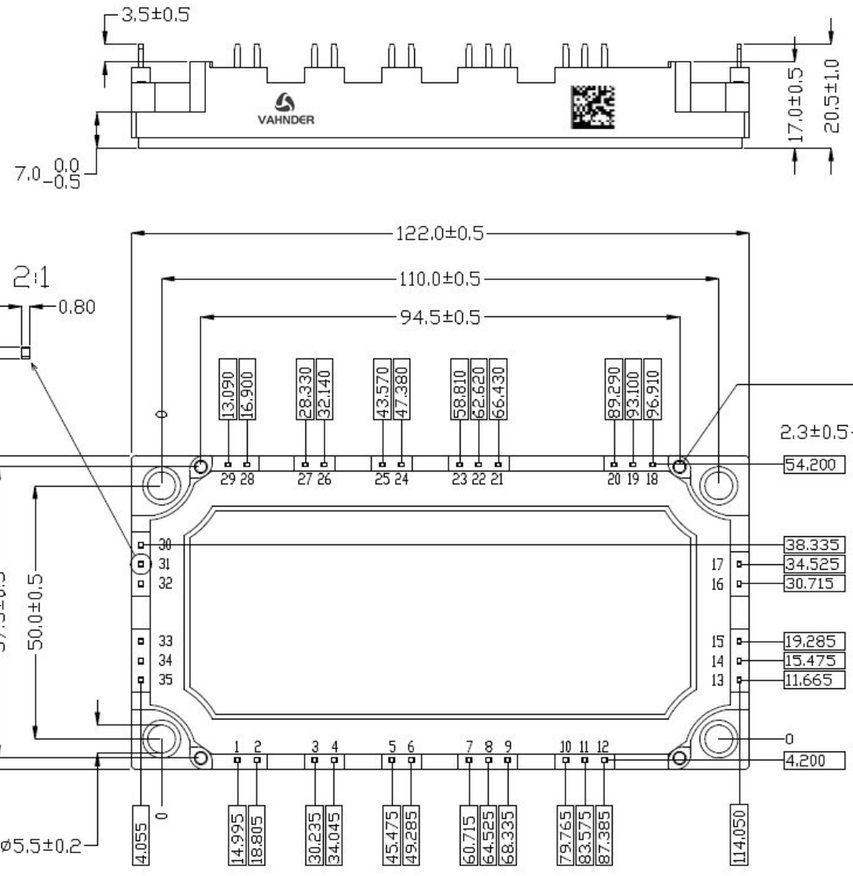
NTC-Thermistor-temperature characteristic (typical)
R=f(T)



Circuit Diagram

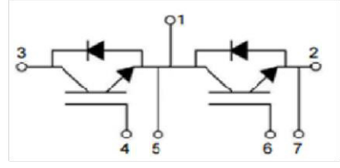


Package outlines



MG100DB120T1

1200V100A IGBT Module 34mm



Equivalent Circuit Schematic

IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	Tvj = 25°C	V_{CES}	1200	V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	100	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	200	A
Total power dissipation	T_C = 25°C, T_{vj} max = 150 °C	P_{tot}	882	W
Gate-emitter peak voltage		V_{GES}	+/- 20	V

Characteristic value

				min.	typ.	Max.	
Collector-emitter saturation voltage	I_C = 100 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$		2.5		V
		T_{vj} = 150°C			3.2		V
Gate threshold voltage	I_C = 1 mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	4.8	5.8	6.8	V
Internal gate resistor	T_{vj} = 25°C		R_{Gint}		0.9		Ω
Input capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V		C_{ies}		7.2		nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V		C_{res}		0.26		pF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Turn-on delay time	I_C = 100A, V_{CE} = 600V V_{GE} = +15/-15V $R_{G,on}$ = 10Ω	T_{vj} = 25°C	$T_{d,on}$		43		ns
		T_{vj} = 150°C			40		ns
Rise time		T_{vj} = 25°C	T_r		75		ns
		T_{vj} = 150°C			77		ns
Turn-off delay time		T_{vj} = 25°C	$T_{d,off}$		288		ns
		T_{vj} = 150°C			313		ns
Fall time		T_{vj} = 25°C	T_f		134		ns
		T_{vj} = 150°C			214		ns
Turn-on energy loss per pulse		T_{vj} = 25°C	E_{on}		10.8		mJ
		T_{vj} = 150°C			17.1		mJ
Turn-off energy loss per pulse		T_{vj} = 25°C	E_{off}		4.3		mJ
		T_{vj} = 150°C			5.9		mJ
Thermal resistance, junction to case			R_{thJC}			0.17	K/W

Electrical Characteristics of Diode

Static characteristics

Forward Voltage	I_F = 100A, V_{GE} = 0 V	T_{vj} = 25°C	V_{FM}		2.2		V
		T_{vj} = 150°C			1.8		

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Characteristic value

				min.	typ.	Max.	
Peak reverse recovery current	I_F = 100A, (T_{vj} = 150°C), V_R = 600V V = 15V L = 525 uH $R_{G,on}$ = 10Ω	T_{vj} = 25°C	I_{RM}		49.8		A
		T_{vj} = 150°C			72.7		
Recovered charge		T_{vj} = 25°C	Q_r		4.7		μC
		T_{vj} = 150°C			12.2		
Reverse recovery energy		T_{vj} = 25°C	E_{rec}		1.8		mJ
		T_{vj} = 150°C			3.1		
Thermal resistance, junction to case	Per diode		$R_{th,JC}$		0.3		K/W

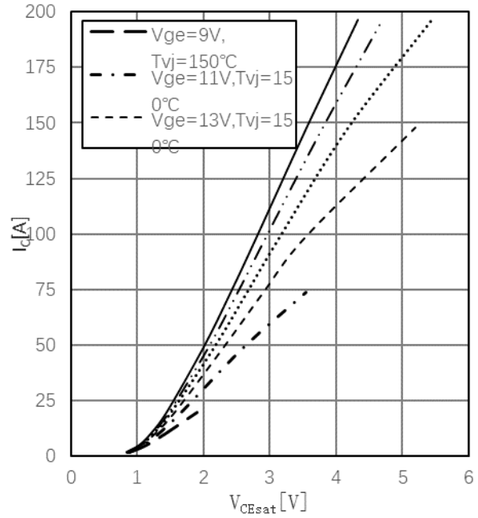


Fig.1 output characteristic IGBT Inverter (typical)

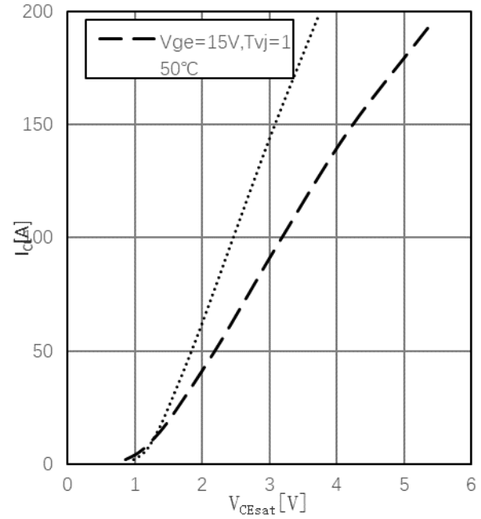


Fig.2 output characteristic IGBT Inverter (typical)

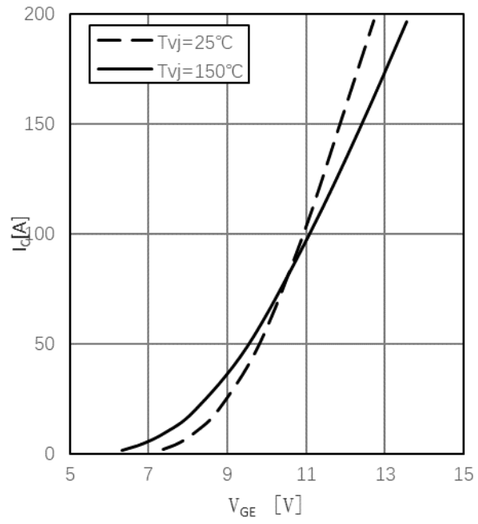


Fig.3 transfer characteristic IGBT Inverter (typical)

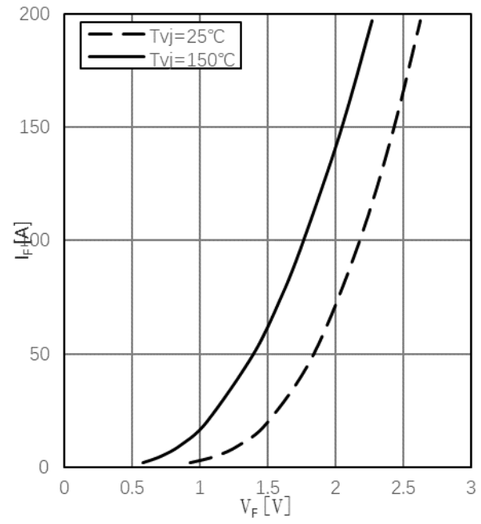


Fig.4 forward characteristic of Diode, Inverter (typical)

V_{CC}=600V，V_{CE}=±15V
R_G=10Ω

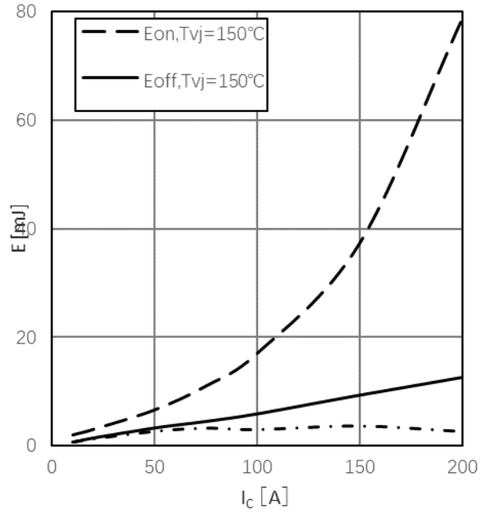


Fig.5 switching losses IGBT Inverter (typical)

V_{CC}=600V，V_{CE}=±15V
IC=100A

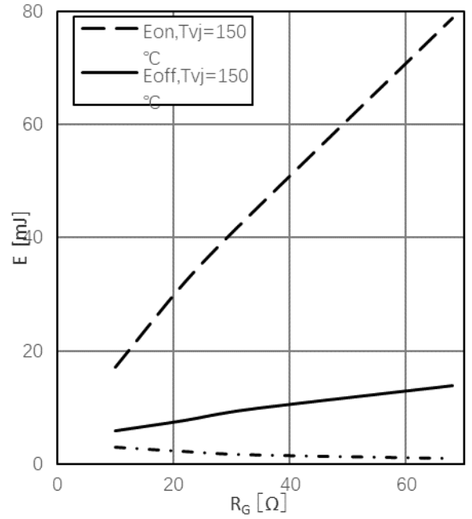


Fig.6 switching Losses vs. Gate Resistance (Typical)

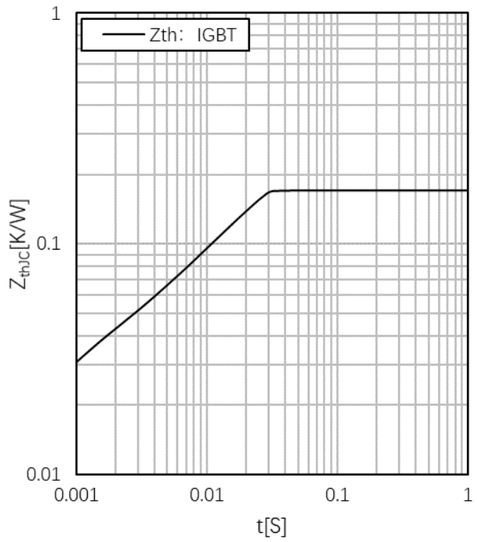


Fig.7 Transient thermal impedance IGBT

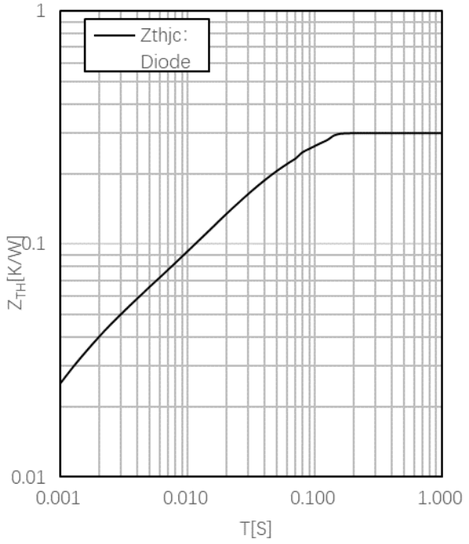
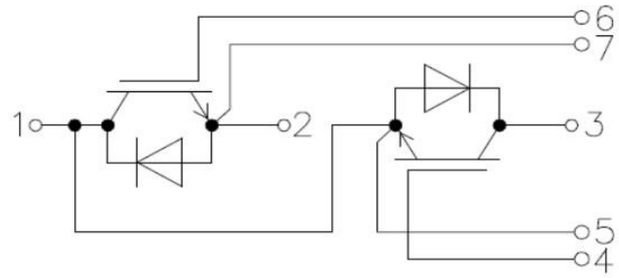
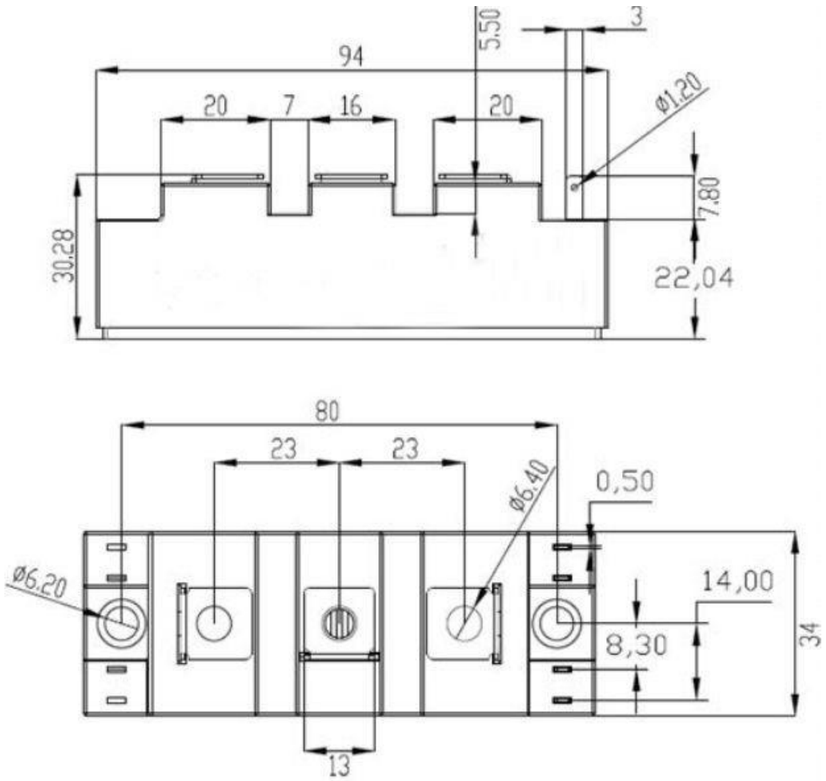


Fig.8 Transient thermal impedance Diode

Internal Circuit:



Package Outline (Unit: mm):



MG150PA120K1

1200V150A EconoPIM3 IGBT Module

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IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200	V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	150	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	340	A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}	410	W
Gate-emitter peak voltage		V_{GES}	+/- 20	V

Characteristic value

			min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 150 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$		1.74		V
	I_C = 150 A, V_{GE} = 15 V	T_{vj} = 125°C					V
	I_C = 150 A, V_{GE} = 15 V	T_{vj} = 150°C			2.13		V
Gate threshold voltage	I_C = 2.8mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.0	6.0	6.5	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G				µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}				Ω
Input capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{ies}				nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{res}				nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Turn-on delay time, inductive load	I_C = 150A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,on}$		0.32		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C					us
Rise time, inductive load	I_C = 150A, V_{CE} = 600V	T_{vj} = 25°C	T_r		0.09		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C					us
Turn-off delay time, inductive load	I_C = 150A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,off}$		0.65		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	R_{Goff} = 15Ω	T_{vj} = 150°C					us
Fall time, inductive load	I_C = 150A, V_{CE} = 600V	T_{vj} = 25°C	T_f		1.1		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	R_{Goff} = 15Ω	T_{vj} = 150°C					us
Turn-on energy loss per pulse	I_C =150A, V_{CE} = 600V, L_S =35 nH	T_{vj} = 25°C	E_{on}		43.1		mJ
	V_{GE} = +15/-15V,	T_{vj} = 125°C					mJ
	R_{Gon} = 15Ω	T_{vj} = 150°C					mJ
Turn-off energy loss per pulse	I_C = 150A, V_{CE} = 600V, L_S = 35nH	T_{vj} = 25°C	E_{off}		23.0		mJ
	V_{GE} =+15/-15V,	T_{vj} = 125°C					mJ

	R_{Goff} = 15Ω T_{vj} = 150°C					mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 25°C , R_G =10Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	I_{SC}		740		A
Thermal resistance, junction to case	per IGBT, grease = 1.3 W/(m·K)	$R_{th,JC}$			0.30	K/W

Diode, Inverter

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}		1200		V
Continuous DC forward current		I_F		150		A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}		300		A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 150 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F		2.06		V
	I_F = 150 A, V_{GE} = 0 V	T_{vj} = 125°C					V
	I_F = 150 A, V_{GE} = 0 V	T_{vj} = 150°C			1.78		V
Peak reverse recovery current	I_F = 150A, V_R = 600V	T_{vj} = 25°C	I_{RM}		145		A
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Recovered charge	I_F = 150A, V_R = 600V	T_{vj} = 25°C	Q_r		25.8		µC
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Reverse recovery energy	I_F = 150A, V_R = 600V	T_{vj} = 25°C	E_{rec}		5.8		mJ
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Thermal resistance, junction to case	Per diode, grease = 1.3 W/(m·K)		$R_{th,JC}$			0.39	K/W

Diode, Rectifier

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1600		V
Average Rectified Output current	V_F = 1.2, T_{vj} = 150°C	I_F	150		A
Surge forward current	t_p = 10 ms, Tvj = 150°C	I_{FSM}	1120		A
I^2t - value	t_p = 10 ms, Tvj = 150°C	I^2t	6272		A^2s

Characteristic value

			min.	typ.	max.	
Forward voltage	T_{vj} = 150°C, I_F = 150 A	V_F		1.11		V
Reverse current	T_{vj} = 150°C, V_R = 1600 V	I_R		0.54		mA
Thermal resistance, junction to case	per Diode	R_{thJC}			0.36	K/W
Thermal resistance, junction to	per Diode, λ grease = 1.3 W/(m·K)	R_{thJH}				K/W

heatsink						

IGBT, Brake-Chopper

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}		1200		V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$		100		A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}		200		A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}		410		W
Gate-emitter peak voltage		V_{GES}		+/- 20		V

Characteristic value

				min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 100 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$		2.15		V
	I_C = 100 A, V_{GE} = 15 V	T_{vj} = 125°C			2.27		V
	I_C = 100 A, V_{GE} = 15 V	T_{vj} = 150°C			2.29		V
Gate threshold voltage	I_C = 5.7mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.0	5.8	6.5	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G		1.73		µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}		2.1		Ω
Input capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V		C_{ies}		21.59		nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V		C_{res}		0.165		nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Turn-on delay time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C			0.298		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	$T_{d,on}$		0.2753		us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C					us
Rise time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C			0.077		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	T_r		0.094		us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C					us
Turn-off delay time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C			0.505		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	$T_{d,off}$		0.559		us
	R_{Goff} = 15Ω	T_{vj} = 150°C					us
Fall time, inductive load	I_C = 100A, V_{CE} = 600V	T_{vj} = 25°C			0.124		us
	V_{GE} = +15/-15V	T_{vj} = 125°C	T_f		0.339		us
	R_{Goff} = 15Ω	T_{vj} = 150°C					us
Turn-on energy loss per pulse	I_C =100A, V_{CE} = 600V, L_S =35 nH	T_{vj} = 25°C			16.49		mJ
	V_{GE} = +15/-15V,	T_{vj} = 125°C	E_{on}				mJ
	R_{Gon} = 15Ω	T_{vj} = 150°C					mJ

Turn-off energy loss per pulse	I_C = 100A, V_{CE} = 600V, L_S = 35nH T_{vj} = 25°C	E_{off}		15.59		mJ
	V_{GE} =+15/-15V, T_{vj} = 125°C			20.71		mJ
	R_{Goff} = 15Ω T_{vj} = 150°C					mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 25°C , R_G =10Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	I_{SC}		520		A
Thermal resistance, junction to case	per IGBT, grease = 1.3 W/(m·K)	$R_{th,JC}$			0.30	K/W

Diode, Brake-Chopper

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1200		V
Continuous DC forward current		I_F	100		A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}	200		A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 100 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F		2.00		V
	I_F = 100 A, V_{GE} = 0 V	T_{vj} = 125°C					V
	I_F = 100 A, V_{GE} = 0 V	T_{vj} = 150°C			1.75		V
Peak reverse recovery current	I_F = 100A, V_R = 600V	T_{vj} = 25°C	I_{RM}		98		A
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Recovered charge	I_F = 100A, V_R = 600V	T_{vj} = 25°C	Q_r		26.4		µC
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Reverse recovery energy	I_F = 100A, V_R = 600V	T_{vj} = 25°C	E_{rec}		9.4		mJ
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Thermal resistance, junction to case	Per diode, grease = 1.3 W/(m·K)		$R_{th,JC}$			0.465	K/W

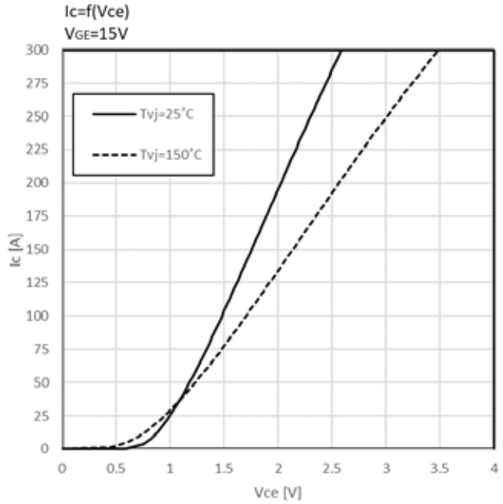
NTC-Thermistor

Characteristic value

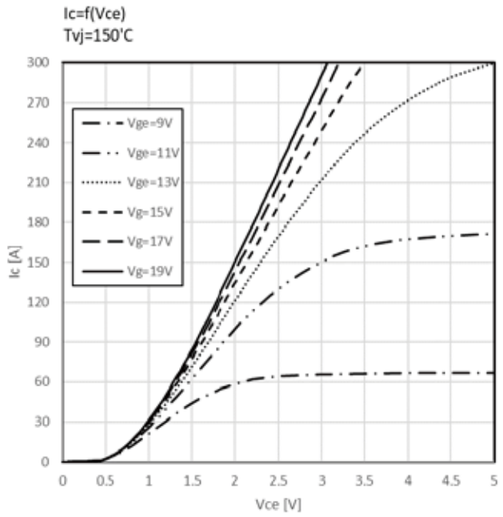
			min.	typ.	max.	
Rated resistance	Tc = 25°C	R_{25}		5.07		KΩ
Power dissipation	Tc = 25°C	P_{25}			240	mW
B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298, 15K))]$	B_{25}/B_{50}		3412.7		K
B-value	$R_2=R_{25}\exp[B_{25/75}(1/T_2-1/(298, 15K))]$	B_{25}/B_{75}		3454.8		K
B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298, 15K))]$	B_{25}/B_{100}		3442.2		K

NIETZ MG150PA120K1

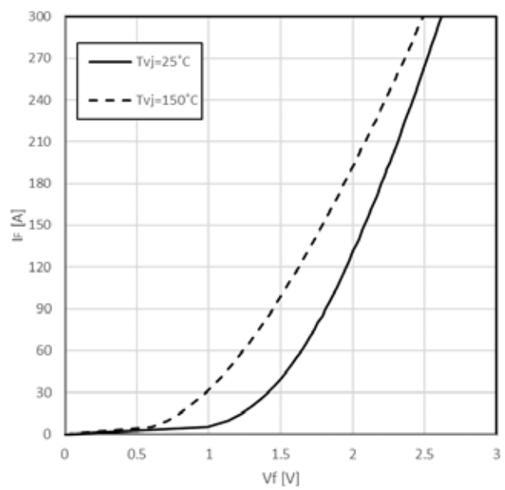
Output characteristic IGBT, Inverter (typical)



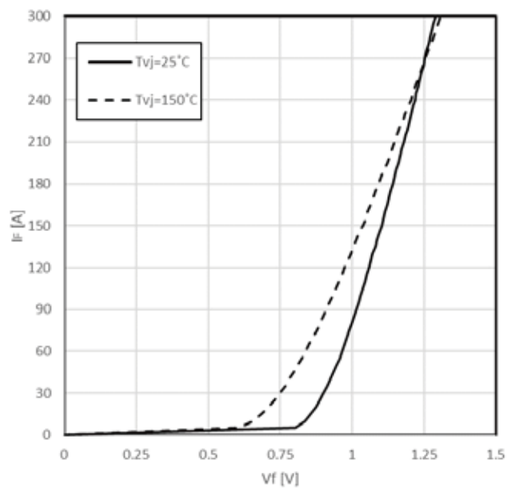
Output characteristic IGBT, Inverter (typical)



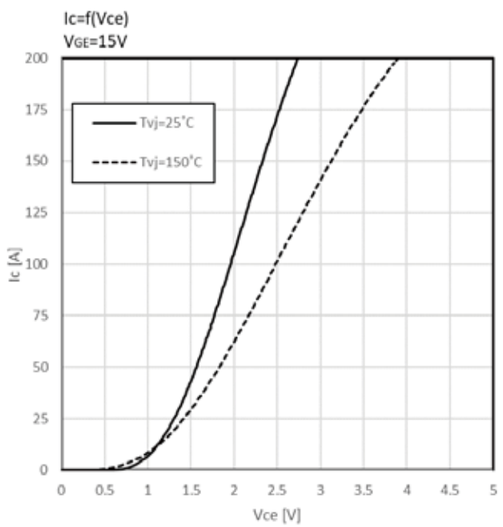
Forward characteristic of Diode, Inverter (typical)
$I_F = f(V_F)$



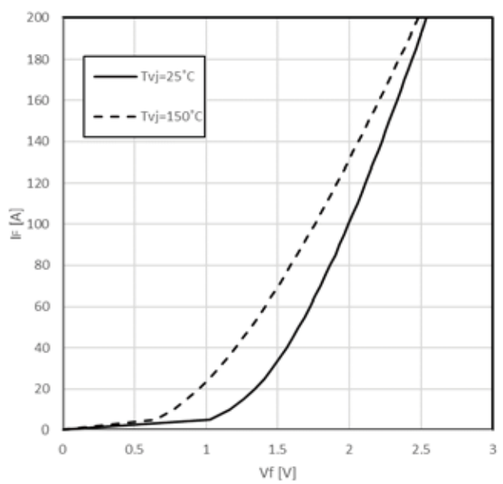
Forward characteristic of Diode, Rectifier (typical)
$I_F = f(V_F)$



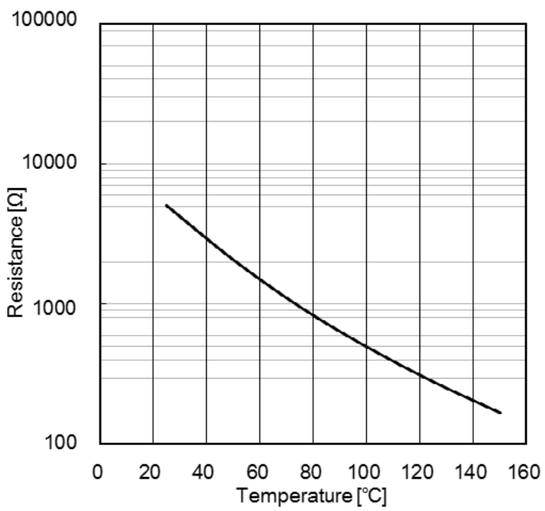
Output characteristic IGBT, Brake-Chopper (typical)



Forward characteristic of Diode, Brake-Chopper (typical)
$I_F = f(V_F)$



NTC-Thermistor-temperature characteristic (typical) R=f(T)



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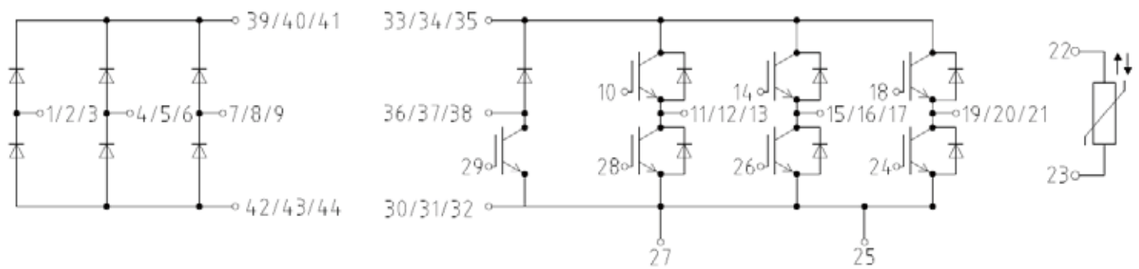
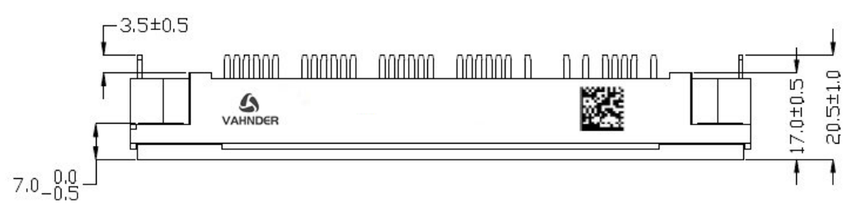
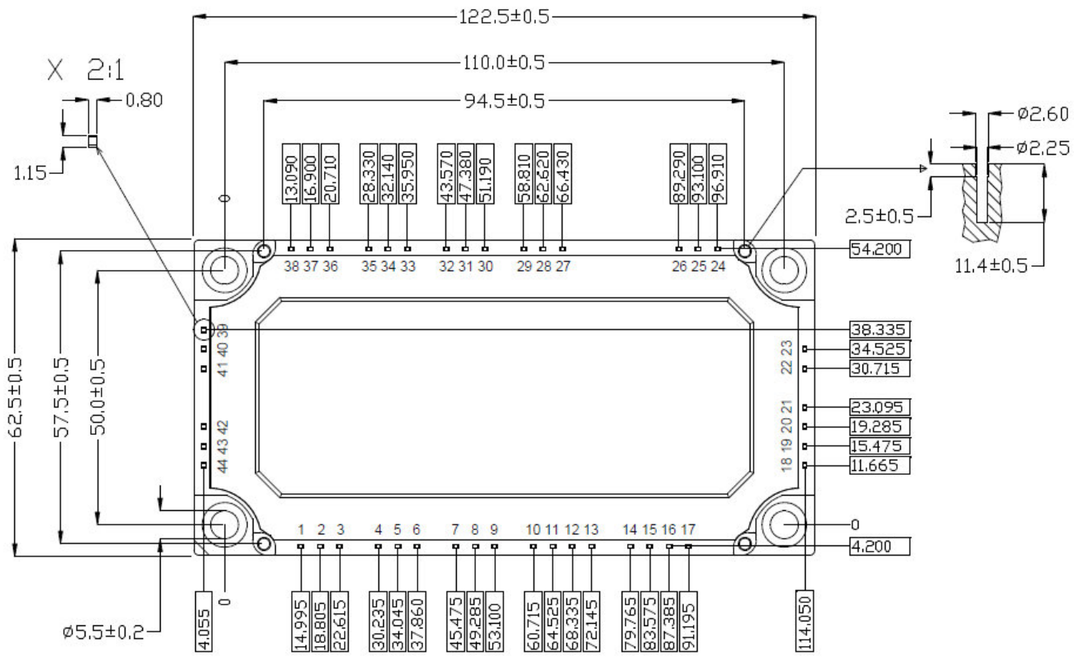
Circuit Diagram



Package outlines





MG150PB120K1

1200V150A EconoPIM3 IGBT Module

NIETZ | MG150PB120K1

IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200	V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	150	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	340	A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}	410	W
Gate-emitter peak voltage		V_{GES}	+/- 20	V

Characteristic value

			min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 150 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$		1.74		V
	I_C = 150 A, V_{GE} = 15 V	T_{vj} = 125°C					V
	I_C = 150 A, V_{GE} = 15 V	T_{vj} = 150°C			2.13		V
Gate threshold voltage	I_C = 1mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.0	6.0	6.5	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G				µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}				Ω
Input capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{ies}				nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{res}				nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Turn-on delay time, inductive load	I_C = 150A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,on}$		0.32		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C					us
Rise time, inductive load	I_C = 150A, V_{CE} = 600V	T_{vj} = 25°C	T_r		0.09		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	$R_{G,on}$ = 15Ω	T_{vj} = 150°C					us
Turn-off delay time, inductive load	I_C = 150A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,off}$		0.65		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	R_{Goff} = 15Ω	T_{vj} = 150°C					us
Fall time, inductive load	I_C = 150A, V_{CE} = 600V	T_{vj} = 25°C	T_f		1.1		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	R_{Goff} = 15Ω	T_{vj} = 150°C					us
Turn-on energy loss per pulse	I_C =150A, V_{CE} = 600V, L_S =35 nH	T_{vj} = 25°C	E_{on}		43.1		mJ
	V_{GE} = +15/-15V,	T_{vj} = 125°C					mJ
	R_{Gon} = 15Ω	T_{vj} = 150°C					mJ
Turn-off energy loss per pulse	I_C = 150A, V_{CE} = 600V, L_S = 35nH	T_{vj} = 25°C	E_{off}		23.0		mJ
	V_{GE} =+15/-15V,	T_{vj} = 125°C					mJ

	R_{Goff} = 15Ω T_{vj} = 150°C					mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 25°C , R_G =10Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	I_{SC}		740		A
Thermal resistance, junction to case	per IGBT, grease = 1.3 W/(m·K)	$R_{th,JC}$			0.30	K/W

Diode, Inverter

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C		V_{RRM}		1200	V
Continuous DC forward current			I_F		150	A
Repetitive peak forward current	t_P = 1 ms		I_{FRM}		300	A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 150 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F		2.06		V
	I_F = 150 A, V_{GE} = 0 V	T_{vj} = 125°C					V
	I_F = 150 A, V_{GE} = 0 V	T_{vj} = 150°C			1.78		V
Peak reverse recovery current	I_F = 150A, V_R = 600V	T_{vj} = 25°C	I_{RM}		145		A
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Recovered charge	I_F = 150A, V_R = 600V	T_{vj} = 25°C	Q_r		25.8		µC
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Reverse recovery energy	I_F = 150A, V_R = 600V	T_{vj} = 25°C	E_{rec}		5.8		mJ
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Thermal resistance, junction to case	Per diode, grease = 1.3 W/(m·K)		$R_{th,JC}$			0.39	K/W

Diode, Rectifier

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}		1600	V
Average Rectified Output current	V_F = 1.2, T_{vj} = 150°C	I_F		150	A
Surge forward current	t_p = 10 ms, Tvj = 150°C	I_{FSM}		1120	A
I^2t - value	t_p = 10 ms, Tvj = 150°C	I^2t		6272	A^2s

Characteristic value

			min.	typ.	max.	
Forward voltage	T_{vj} = 150°C, I_F = 150 A	V_F		1.11		V
Reverse current	T_{vj} = 150°C, V_R = 1600 V	I_R		0.54		mA
Thermal resistance, junction to case	per Diode	R_{thJC}			0.36	K/W
Thermal resistance, junction to	per Diode, λ grease = 1.3 W/(m·K)	R_{thJH}				K/W

NIETZ

NIETZ MG150PB120K1

heatsink						

NTC-Thermistor

Characteristic value

			min.	typ.	max.	
Rated resistance	Tc = 25°C	R_{25}		5.07		KΩ
Power dissipation	Tc = 25°C	P_{25}			240	mW
B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298, 15K))]$	B_{25}/B_{50}		3412.7		K
B-value	$R_2=R_{25}\exp[B_{25/75}(1/T_2-1/(298, 15K))]$	B_{25}/B_{75}		3454.8		K
B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298, 15K))]$	B_{25}/B_{100}		3442.2		K

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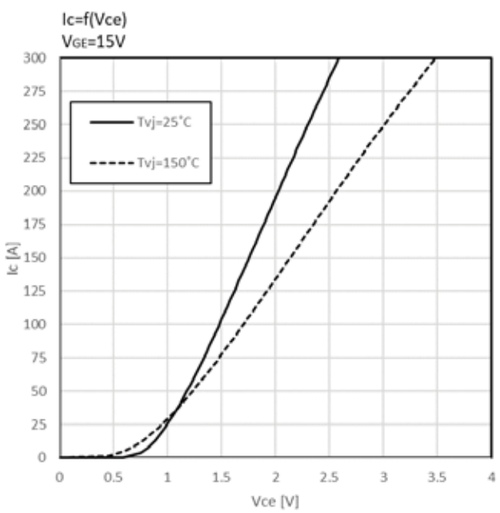
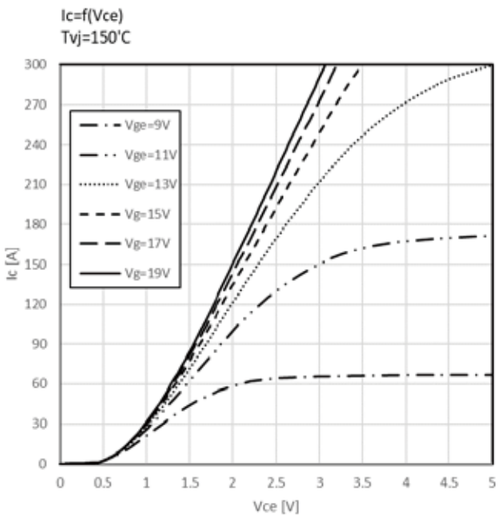
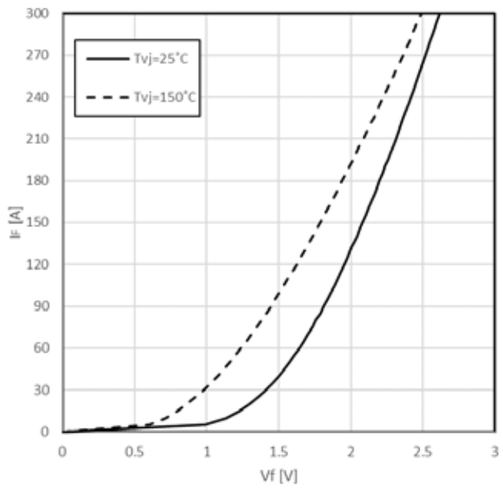
Output characteristic IGBT, Inverter (typical)



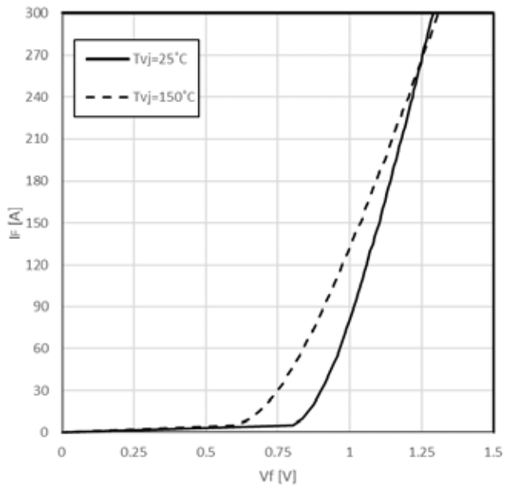
Output characteristic IGBT, Inverter (typical)



Forward characteristic of Diode, Inverter (typical)
$I_F = f(V_F)$

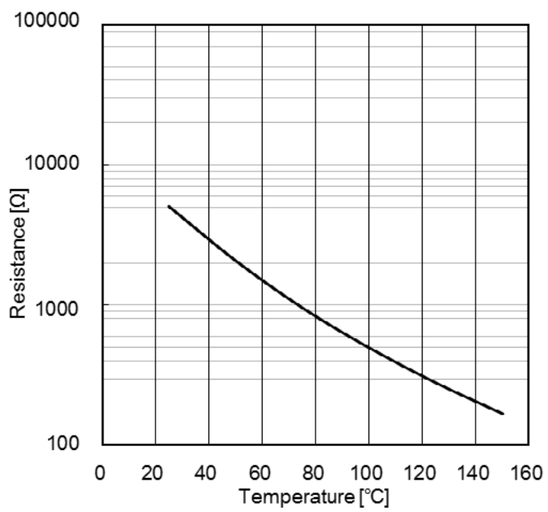


Forward characteristic of Diode, Rectifier (typical)
$I_F = f(V_F)$



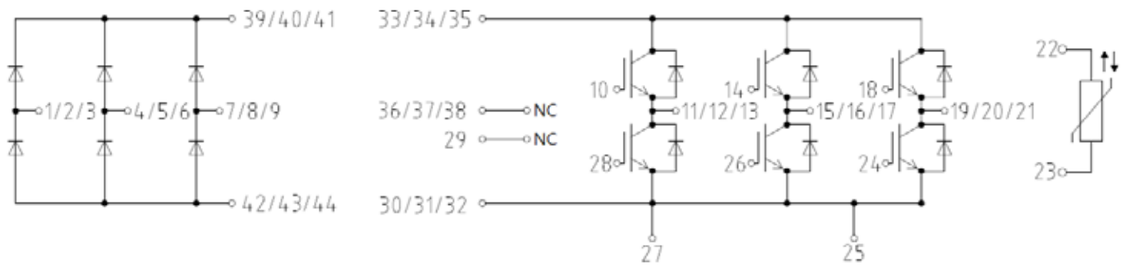
NIETZ MG150PB120K1

NTC-Thermistor-temperature characteristic (typical) R=f(T)

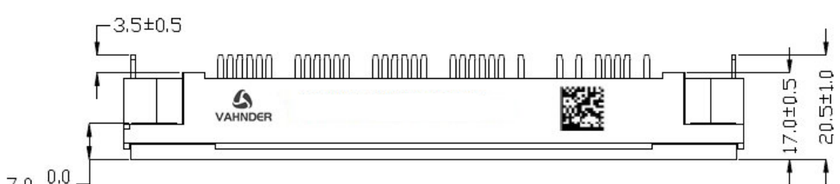


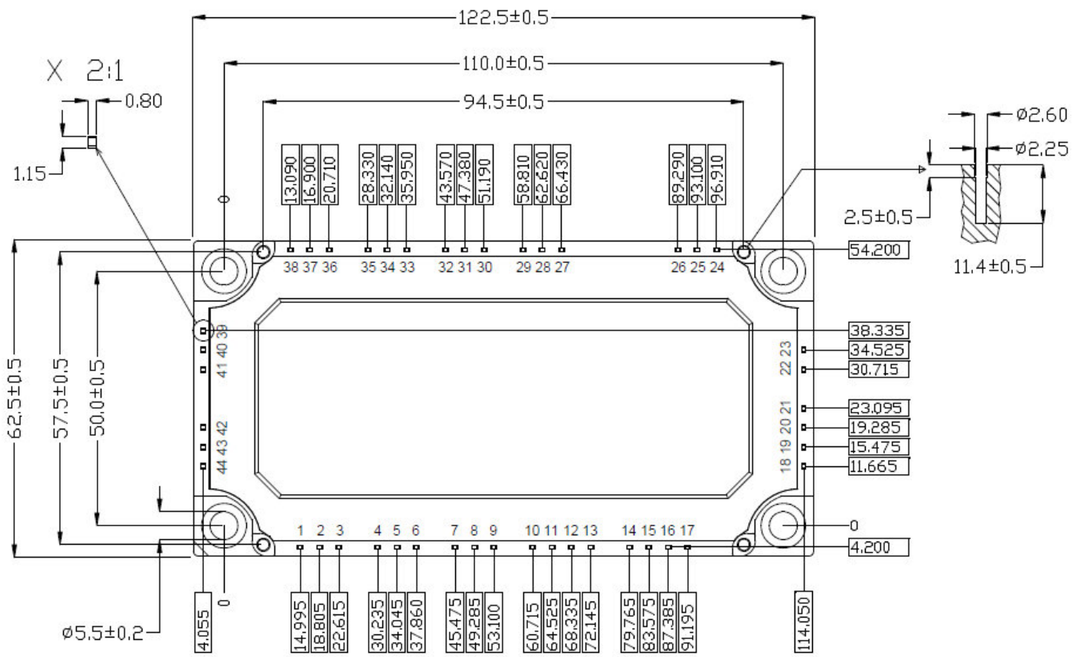
NIETZ	MG150PB120K1

Circuit Diagram



Package outlines





MG200DB120T0
1200V200A Y62 IGBT Module

IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	Tvj = 25°C	V_{CES}	1200	V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	200	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	400	A
Gate-emitter peak voltage	T_C = 25°C, T_{vj} max = 150 °C	V_{GES}	+/- 20	V

Characteristic value

			min.	typ.	Max.	
Collector-emitter saturation voltage	I_C = 200 A, V_{GE} = 15 V T_{vj} = 25°C	$V_{CE,sat}$		1.8	2.15	V
	I_C = 200 A, V_{GE} = 15 V T_{vj} = 125°C			2.1		V
	I_C = 200 A, V_{GE} = 15 V T_{vj} = 150°C			2.15		V
Gate threshold voltage	IC=11.4mA,VCE=VGE,Tj=25℃	$V_{GE,th}$	5.0	6.0	6.5	V
Gate charge	V_{GE} = -15 V ... +15 V	Q_G		2		µC
Internal gate resistor	T_{vj} = 25°C	R_{Gint}		4		Ω
Input capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V	C_{ies}		15		nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V	C_{res}		0.6		nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C	I_{CES}		0.1	5	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C	I_{GES}		6	400	nA
Turn-on delay time, inductive load	I_C = 200A, V_{CE} = 600V T_{vj} = 25°C	$T_{d,on}$		210		ns
	V_{GE} = +15/-15V T_{vj} = 125°C			260		ns
	$R_{G,on}$ = 5Ω T_{vj} = 150°C			280		ns
Rise time, inductive load	I_C = 200A, V_{CE} = 600V T_{vj} = 25°C	T_r		47		ns
	V_{GE} = +15/-15V T_{vj} = 125°C			51		ns
	$R_{G,on}$ = 5Ω T_{vj} = 150°C			56		ns
Turn-off delay time, inductive load	I_C = 200A, V_{CE} = 600V	$T_{d,off}$				
	V_{GE} = +15/-15V T_{vj} = 25°C			510		ns
	R_{Goff} = 5Ω T_{vj} = 125°C			610		ns
	T_{vj} = 150°C			630		ns
Fall time, inductive load	I_C = 200A, V_{CE} = 600V	T_f				
	V_{GE} = +15/-15V T_{vj} = 25°C			110		ns
	R_{Goff} = 5Ω T_{vj} = 125°C			170		ns
	T_{vj} = 150°C			200		ns

Turn-on energy loss per pulse	I_C =200A, V_{CE} = 600V, V_{GE} = +15/-15V, di/dt =3600A/μs (T_{vj} = 150° C), R_{Gon} = 5Ω	T_{vj} = 25° C T_{vj} = 125° C T_{vj} = 150° C	E_{on}	11 16 21		mJ mJ mJ
Turn-off energy loss per pulse	I_C = 200A, V_{CE} = 600V, V_{GE} =+15/-15V, dv/dt =3600/μs (T_{vj} = 150° C), R_{Goff} = 5Ω	T_{vj} = 25° C T_{vj} = 125° C T_{vj} = 150° C	E_{off}	19 29 31		mJ mJ mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 μs, T_{vj} = 150° C , R_G =5Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} - L_{sCE} ·di/dt		I_{SC}	850		A
Thermal resistance, junction to case	per IGBT, grease = 1.3 W/(m·K)		$R_{th,JC}$	0.16		K/W

Diode

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C		V_{RRM}	1200	V
Continuous DC forward current			I_F	200	A
Repetitive peak forward current	t_P = 1 ms		I_{FRM}	400	A
I^2t - value	V_R = 0 V, t_P = 10 ms, T_{vj} = 125°C		I^2t	7400	A^2s

Characteristic value				**min.**	**typ.**	**Max.**	
Forward voltage	I_C = 200 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F		1.5		V
	I_C = 200 A, V_{GE} = 0V	T_{vj} = 125°C			1.5		V
	I_C = 200 A, V_{GE} = 0 V	T_{vj} = 150°C			1.5		V

Peak reverse recovery current	I_F = 200A, -di_F/dt =3600A/μs (T_{vj} = 150°C), V_R = 600V V_{GE} = -15V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	I_{RM}		235 252 265		A
Recovered charge	I_F = 200A, -di_F/dt =3600A/μs (T_{vj} = 150°C), V_R = 600V V_{GE} = -15V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	Q_r		20 33 46		μC
Reverse recovery energy	I_F = 200A, -di_F/dt =3600A/μs (T_{vj} = 150°C), V_R = 600V V_{GE} = -15V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{rec}		10 17 19		mJ
Thermal resistance, junction to case	Per diode, grease = 1.3 W/(m·K)		$R_{th,JC}$			0.2	K/W

Diagram of Technical Features

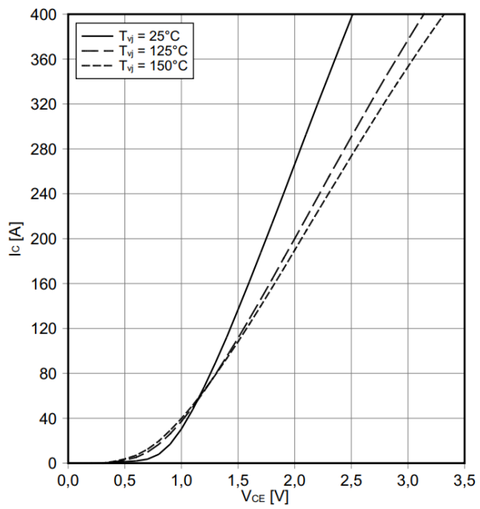
Output

IC = f(VCE)
VGE = 15 V

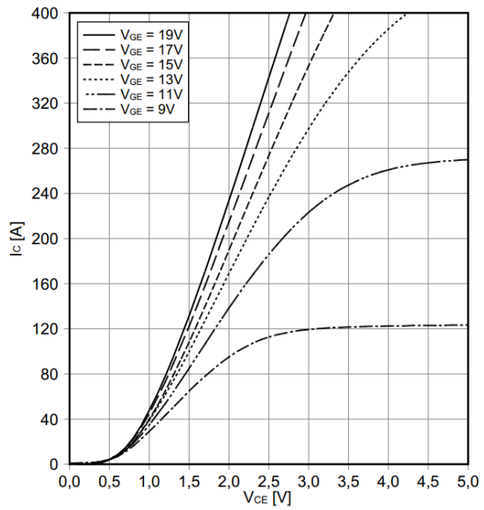
Output

IC = f(VCE)
Tvj = 150°C

Output characteristic IGBT, Inverter (typical)



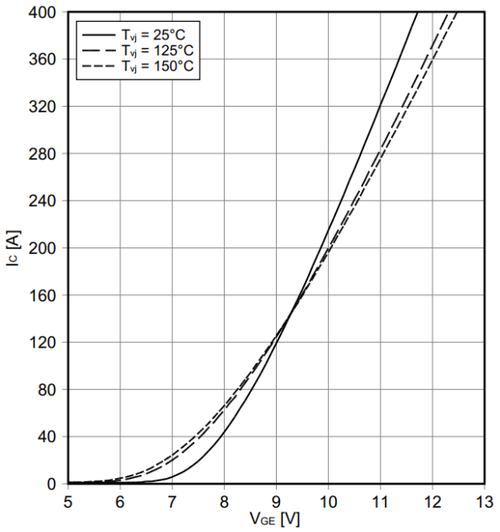
Output characteristic IGBT, Inverter (typical)



传输特性

IC = f(VGE)

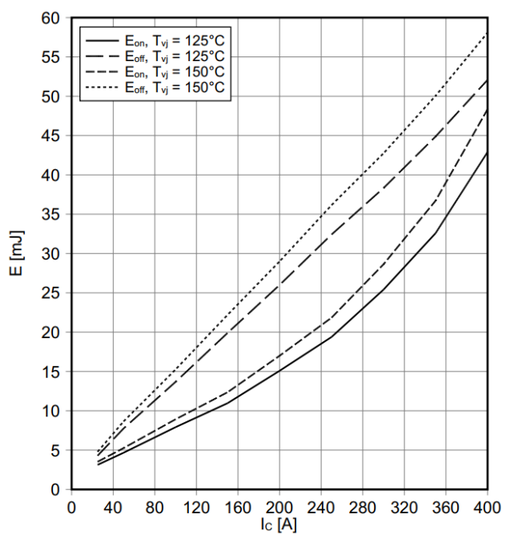
VCE = 20 V



开关损耗

Eon=f(IC), Eoff=f(IC)

VGE=±15V, RGon=5Ω, RGoff=5Ω, VCE=600V



反偏安全工作区 IGBT,逆变器（RBSOA）

IC=f(VCE)

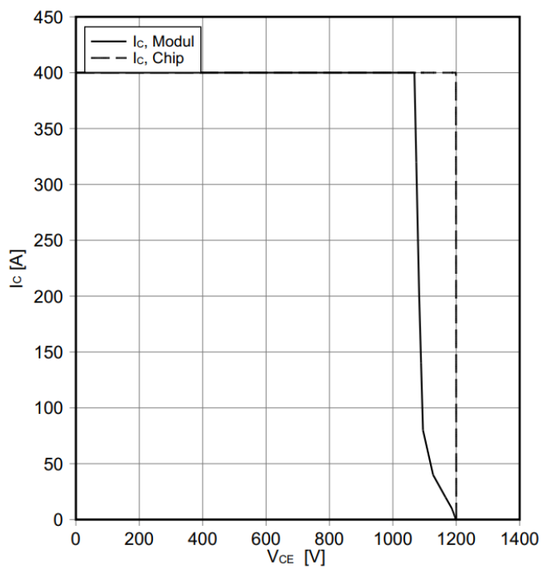
VGE=±15V, RGoff=2.7Ω, Tvj=150° C

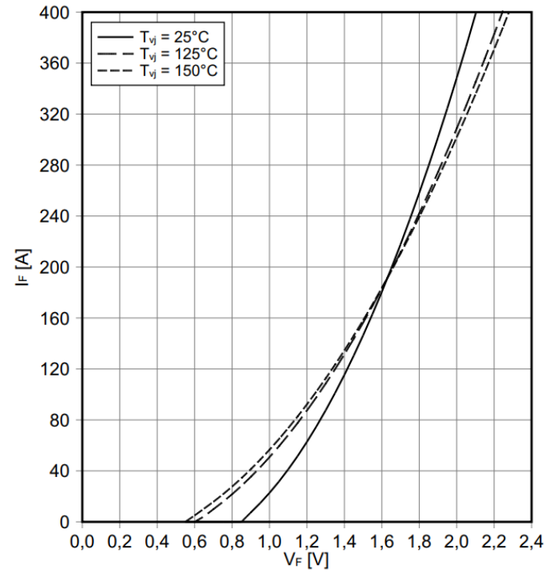
正向偏压特性二极管

IF=f(VF)

NIETZ

NIETZ MG200DB120T0

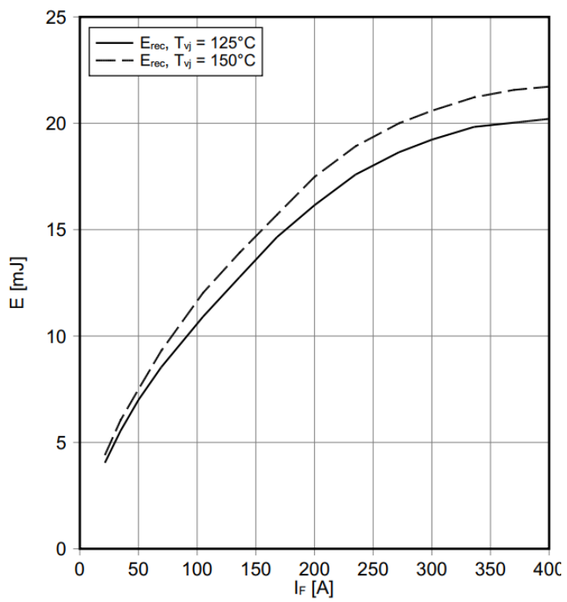




开关损耗二极管

Erec=f(IF)

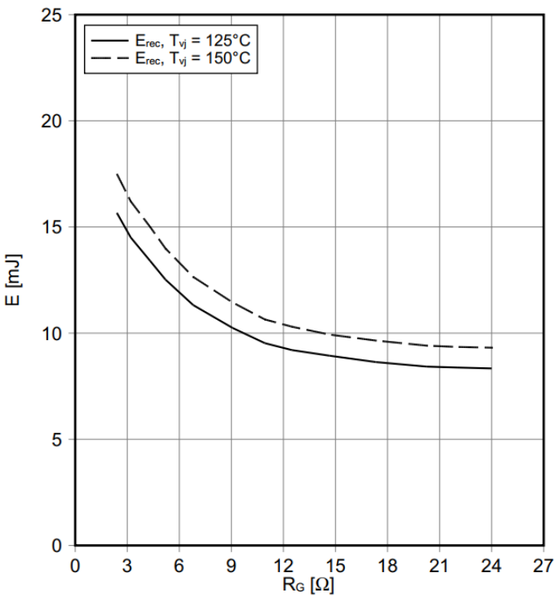
RGon=5Ω, VCE=600V



开关损耗二极管

Erec=f(RG)

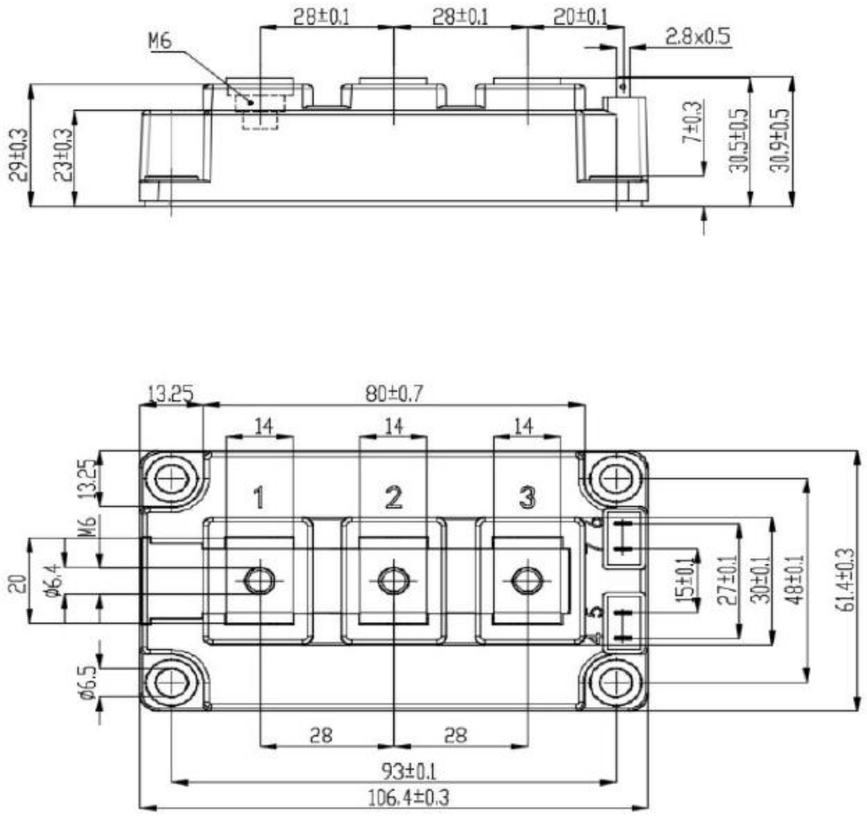
IF=200A, VCE=600V



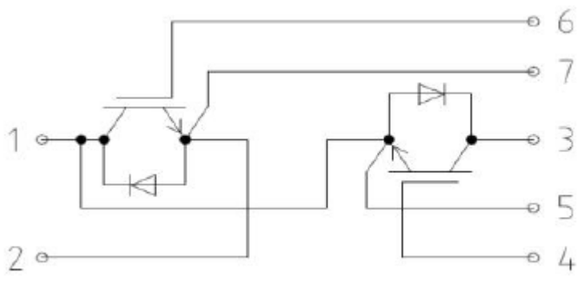
NIETZ

NIETZ	MG200DB120T0

Package outlines



Circuit Diagram



NIETZ

MG300DA120M0

1200V 300A EconoDual3 IGBT Module

NIETZ | MG300DA120M0

IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200	V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	300	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	600	A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}	735	W
Gate-emitter peak voltage		V_{GES}	+/- 20	V

Characteristic value

			min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 300 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$		1.55		V
	I_C = 300 A, V_{GE} = 15 V	T_{vj} = 125°C					V
	I_C = 300 A, V_{GE} = 15 V	T_{vj} = 150°C					V
Gate threshold voltage	I_C = 11.4mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.0	6.0	6.5	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G		1.7		µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}		2.1		Ω
Input capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{ies}		21.6		nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{res}		0.16		nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			2	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			200	nA
Turn-on delay time, inductive load	I_C = 300A, V_{CE} = 600V	T_{vj} = 25°C					us
	V_{GE} = +15/-15V	T_{vj} = 125°C	$T_{d,on}$				us
	$R_{G,on}$ = 5Ω	T_{vj} = 150°C			0.29		us
Rise time, inductive load	I_C = 300A, V_{CE} = 600V	T_{vj} = 25°C					us
	V_{GE} = +15/-15V	T_{vj} = 125°C	T_r				us
	$R_{G,on}$ = 5Ω	T_{vj} = 150°C			0.10		us
Turn-off delay time, inductive load	I_C = 300A, V_{CE} = 600V	T_{vj} = 25°C					us
	V_{GE} = +15/-15V	T_{vj} = 125°C	$T_{d,off}$				us
	R_{Goff} = 5Ω	T_{vj} = 150°C			0.74		us
Fall time, inductive load	I_C = 300A, V_{CE} = 600V	T_{vj} = 25°C					us
	V_{GE} = +15/-15V	T_{vj} = 125°C	T_f				us
	R_{Goff} = 5Ω	T_{vj} = 150°C			0.36		us
Turn-on energy loss per pulse	I_C =300A, V_{CE} = 600V, L_S =35 nH	T_{vj} = 25°C					mJ
	V_{GE} = +15/-15V,	T_{vj} = 125°C	E_{on}				mJ
	R_{Gon} = 5Ω, Tj=150°C	T_{vj} = 150°C			57		mJ
Turn-off energy loss per pulse	I_C = 300A, V_{CE} = 600V, L_S = 35nH	T_{vj} = 25°C	E_{off}				mJ
	V_{GE} =+15/-15V	T_{vj} = 125°C					mJ

	R_{Goff} = 5Ω, Tj=150°C T_{vj} = 150°C			48.6		mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 25°C , R_G =5Ω , C_{GE} = 0.0UF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	I_{SC}		1450		A
Thermal resistance, junction to case	per IGBT, grease = 1.3 W/(m·K)	$R_{th,JC}$			0.17	K/W

Diode, Inverter

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1200		V
Continuous DC forward current		I_F	300		A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}	600		A

Characteristic value

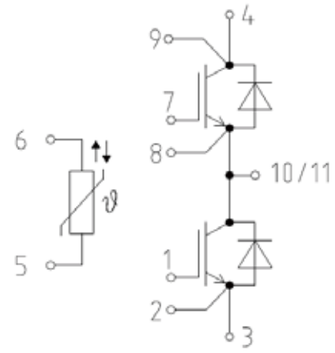
			min.	typ.	max.	
Forward voltage	I_F = 300 A, V_{GE} = 0 V T_{vj} = 25°C	V_F		2.0		V
	I_F = 300 A, V_{GE} = 0 V T_{vj} = 125°C					V
	I_F = 300 A, V_{GE} = 0 V T_{vj} = 150°C					V
Peak reverse recovery current	I_F = 300A, V_R = 600V T_{vj} = 25°C	I_{RM}				A
	V_{GE} = -15V T_{vj} = 125°C					
	T_{vj} = 150°C			290		
Recovered charge	I_F = 300A, V_R = 600V T_{vj} = 25°C	Q_r				µC
	V_{GE} = -15V, T_{vj} = 125°C					
	R_{Goff} = 5Ω, Tj=150°C T_{vj} = 150°C			50		
Reverse recovery energy	I_F = 300A, V_R = 600V T_{vj} = 25°C	E_{rec}				mJ
	V_{GE} = -15V, T_{vj} = 125°C					
	R_{Goff} = 5Ω, Tj=150°C T_{vj} = 150°C			12.8		
Thermal resistance, junction to case	Per Diode	$R_{th,JC}$			0.22	K/W

NTC-Thermistor

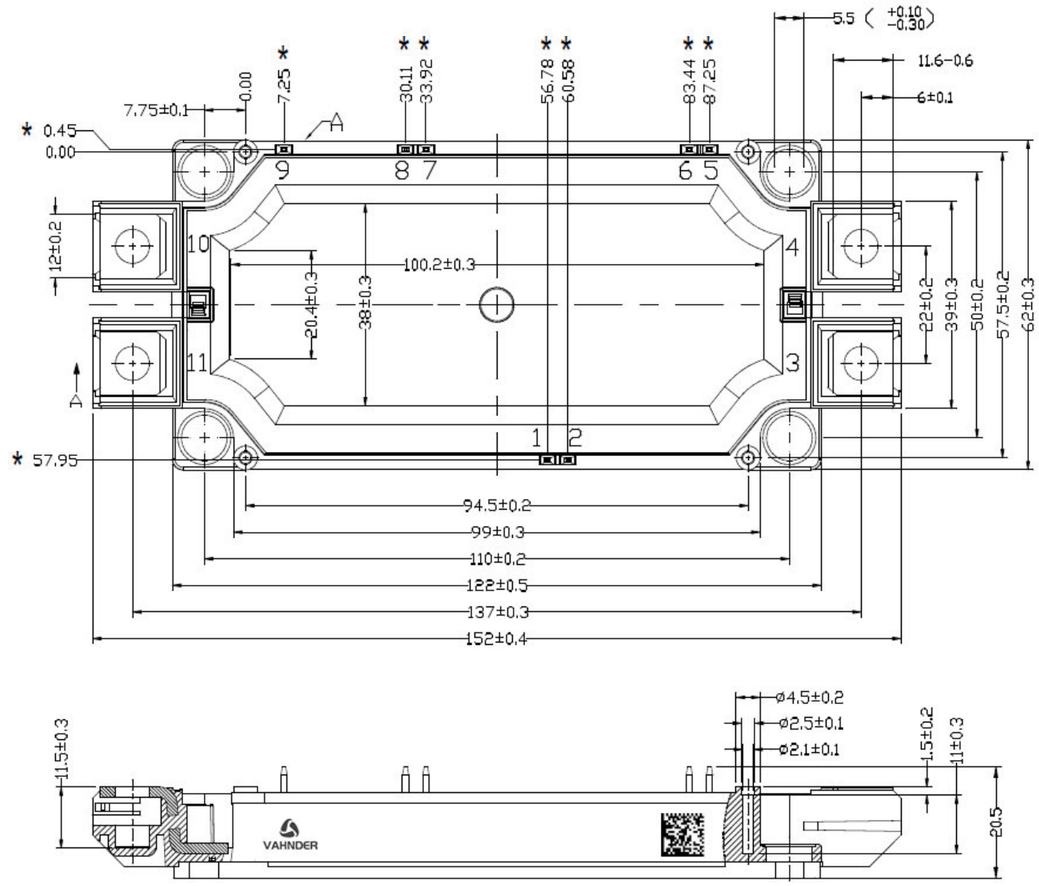
Characteristic value

			min.	typ.	max.	
Rated resistance	Tc = 25°C	R_{25}		5.07		KΩ
Power dissipation	Tc = 25°C	P_{25}			240	mW
B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298, 15K))]$	B_{25}/B_{50}		3412.7		K
B-value	$R_2=R_{25}\exp[B_{25/75}(1/T_2-1/(298, 15K))]$	B_{25}/B_{75}		3454.8		K
B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298, 15K))]$	B_{25}/B_{100}		3442.2		K

Circuit Diagram



Package outlines



MG300DB120T0

1200V300A IGBT Module

NIETZ | MG300DB120T0

IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	Tvj = 25°C	V_{CES}	1200	V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	300	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	600	A
Total power dissipation	T_C = 25°C, T_{vj} max = 150 ˚C	P_{tot}	735	W
Gate-emitter peak voltage		V_{GES}	+/- 20	V

Characteristic value

			min.	typ.	Max.	
Collector-emitter saturation voltage	I_C = 300 A, V_{GE} = 15 V T_{vj} = 25°C	$V_{CE,sat}$		1.55		V
	I_C = 300 A, V_{GE} = 15 V T_{vj} = 125°C					V
	I_C = 300 A, V_{GE} = 15 V T_{vj} = 150°C					V
Gate threshold voltage	I_C = 11.4mA, V_{CE} = V_{GE}, T_{vj} = 25°C	$V_{GE,th}$	5.0	6.0	6.5	V
Gate charge	V_{GE} = -15 V ... +15 V	Q_G		1.7		µC
Internal gate resistor	T_{vj} = 25°C	R_{Gint}		2.1		Ω
Input capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V	C_{ies}		22.0		nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V	C_{res}		0.16		nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C	I_{CES}			2	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C	I_{GES}			200	nA
Turn-on delay time, inductive load	I_C = 300A, V_{CE} = 600V T_{vj} = 25°C					ns
	V_{GE} = +15/-15V T_{vj} = 125°C	$T_{d,on}$				ns
	$R_{G,on}$ = 5Ω T_{vj} = 150°C			0.29		ns
Rise time, inductive load	I_C = 300A, V_{CE} = 600V T_{vj} = 25°C					ns
	V_{GE} = +15/-15V T_{vj} = 125°C	T_r				ns
	$R_{G,on}$ = 5Ω T_{vj} = 150°C			0.11		ns
Turn-off delay time, inductive load	I_C = 300A, V_{CE} = 600V T_{vj} = 25°C					ns
	V_{GE} = +15/-15V T_{vj} = 125°C	$T_{d,off}$				ns
	R_{Goff} = 5Ω T_{vj} = 150°C			0.73		ns
Fall time, inductive load	I_C = 300A, V_{CE} = 600V T_{vj} = 25°C					ns
	V_{GE} = +15/-15V T_{vj} = 125°C	T_f				ns
	R_{Goff} =5Ω T_{vj} = 150°C			0.37		ns
Turn-on energy loss per pulse	I_C =300A, V_{CE} = 600V, T_{vj} = 25°C					mJ
	L_S =35 nH T_{vj} = 125°C	E_{on}				mJ
	V_{GE} = +15/-15V T_{vj} = 150°C			57		mJ

	R_{Gon} = 5Ω					
Turn-off energy loss per pulse	I_C = 300A, V_{CE} = 600V, L_S = 35 nH T_{vj} = 25°C V_{GE} =+15/-15V T_{vj} = 125°C (T_{vj} = 150°C), R_{Goff} = T_{vj} = 150°C 5Ω	E_{off}		48.6		mJ mJ mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 150°C , R_G =5Ω , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	I_{SC}		1450		A
Thermal resistance, junction to case	per IGBT, grease = 1.3 W/(m·K)	$R_{th,JC}$			0.17	K/W

Diode, Inverter

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1200	V
Continuous DC forward current		I_F	300	A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}	600	A
I^2t - value	V_R = 0 V, t_P = 10 ms, T_{vj} = 125°C	I^2t	18500	A^2s

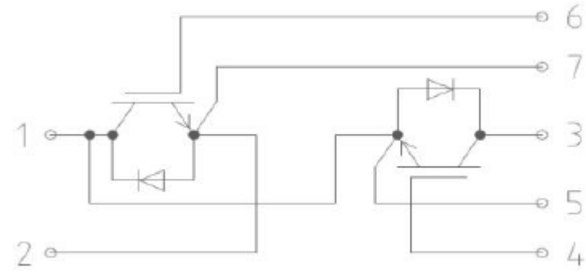
Characteristic value

			min.	typ.	Max.	
Forward voltage	I_C = 300 A, V_{GE} = 0 V T_{vj} = 25°C I_C = 300 A, V_{GE} = 0V T_{vj} = 125°C I_C = 300 A, V_{GE} = 0 V T_{vj} = 150°C	V_F		2		V V V
Peak reverse recovery current	I_F = 300A, (T_{vj} = 150°C), T_{vj} = 25°C V_R = 600V T_{vj} = 125°C V_{GE} = -15V T_{vj} = 150°C	I_{RM}		290		A A A
Recovered charge	I_F = 300A, T_{vj} = 25°C (T_{vj} = 150°C), V_R = T_{vj} = 125°C 600V T_{vj} = 150°C V_{GE} = -15V	Q_r		50		µC µC µC
Reverse recovery energy	I_F = 300A, T_{vj} = 25°C (T_{vj} = 150°C), V_R = T_{vj} = 125°C 600V T_{vj} = 150°C V_{GE} = -15V	E_{rec}		13		mJ
Thermal resistance, junction to case	Per diode	$R_{th,JC}$			0.22	K/W

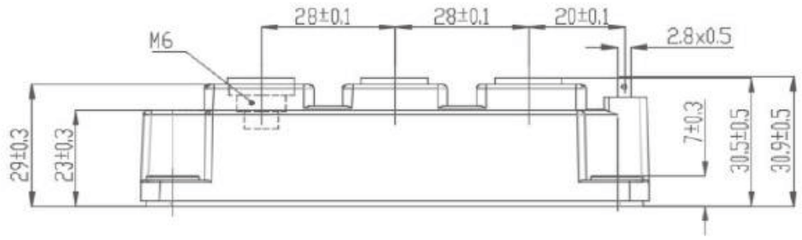
NIETZ

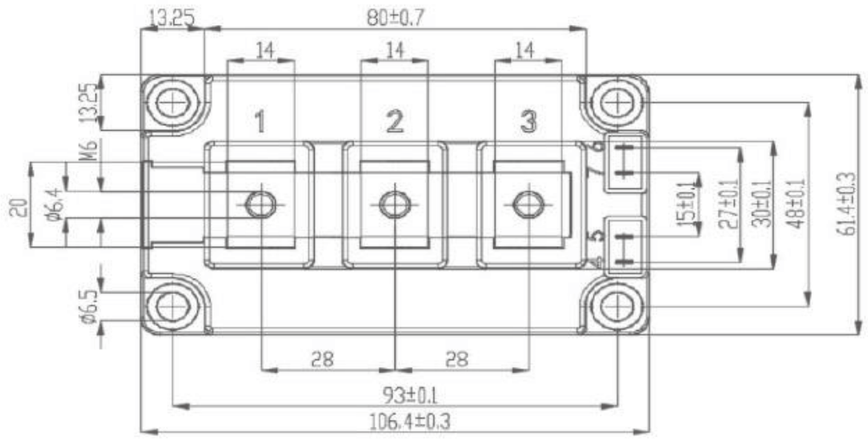
NIETZ MG300DB120T0

Circuit Diagram



Package outlines





MG450DA120M0

1200V450A EconoDual3 IGBT Module

NIETZ | MG450DA120M0

IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200	V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$	450	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	900	A
Total power dissipation	T_C = 25°C, T_{vj} max = 150	P_{tot}	950	W
Gate-emitter peak voltage		V_{GES}	+/- 20	V

Characteristic value

			min.	typ.	max.	
Collector-emitter saturation voltage	I_C = 450 A, V_{GE} = 15 V	T_{vj} = 25°C	$V_{CE,sat}$		1.6		V
	I_C = 450 A, V_{GE} = 15 V	T_{vj} = 125°C					V
	I_C = 450 A, V_{GE} = 15 V	T_{vj} = 150°C					V
Gate threshold voltage	I_C = 17.1mA, V_{CE} = V_{GE}, T_{vj} = 25°C		$V_{GE,th}$	5.0	5.8	6.5	V
Gate charge	V_{GE} = -15 V ... +15 V		Q_G				µC
Internal gate resistor	T_{vj} = 25°C		R_{Gint}				Ω
Input capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{ies}				nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C, V_{CE}=25V, V_{GE}=0V		C_{res}				nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			3	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			300	nA
Turn-on delay time, inductive load	I_C = 450A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,on}$		0.22		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	$R_{G,on}$ = 2Ω	T_{vj} = 150°C					us
Rise time, inductive load	I_C = 450A, V_{CE} = 600V	T_{vj} = 25°C	T_r		0.09		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	$R_{G,on}$ = 2Ω	T_{vj} = 150°C					us
Turn-off delay time, inductive load	I_C = 450A, V_{CE} = 600V	T_{vj} = 25°C	$T_{d,off}$		0.70		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	R_{Goff} = 2Ω	T_{vj} = 150°C					us
Fall time, inductive load	I_C = 450A, V_{CE} = 600V	T_{vj} = 25°C	T_f		0.37		us
	V_{GE} = +15/-15V	T_{vj} = 125°C					us
	R_{Goff} = 2Ω	T_{vj} = 150°C					us
Turn-on energy loss per pulse	I_C =450A, V_{CE} = 600V, L_S =20 nH	T_{vj} = 25°C	E_{on}		36.0		mJ
	V_{GE} = +15/-15V,	T_{vj} = 125°C					mJ
	R_{Gon} = 2Ω	T_{vj} = 150°C					mJ
Turn-off energy loss per pulse	I_C = 450A, V_{CE} = 600V, L_S = 20nH	T_{vj} = 25°C	E_{off}		74.0		mJ
	V_{GE} =+15/-15V,	T_{vj} = 125°C					mJ

	R_{Goff} = 2Ω T_{vj} = 150°C					mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 µs, T_{vj} = 25°C , R_G =5Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	I_{SC}		2100		A
Thermal resistance, junction to case	per IGBT, grease = 1.3 W/(m·K)	$R_{th,JC}$			0.13	K/W

Diode, Inverter

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}		1200		V
Continuous DC forward current		I_F		450		A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}		900		A

Characteristic value

				min.	typ.	max.	
Forward voltage	I_F = 450 A, V_{GE} = 0 V	T_{vj} = 25°C	V_F		2.0		V
	I_F = 450 A, V_{GE} = 0 V	T_{vj} = 125°C					V
	I_F = 450 A, V_{GE} = 0 V	T_{vj} = 150°C					V
Peak reverse recovery current	I_F = 450A, V_R = 600V	T_{vj} = 25°C	I_{RM}		580		A
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Recovered charge	I_F = 450A, V_R = 600V	T_{vj} = 25°C	Q_r		85		µC
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Reverse recovery energy	I_F = 450A, V_R = 600V	T_{vj} = 25°C	E_{rec}		39		mJ
	V_{GE} = -15V	T_{vj} = 125°C					
		T_{vj} = 150°C					
Thermal resistance, junction to case	Per diode, grease = 1.3 W/(m·K)		$R_{th,JC}$			0.17	K/W

NTC-Thermistor

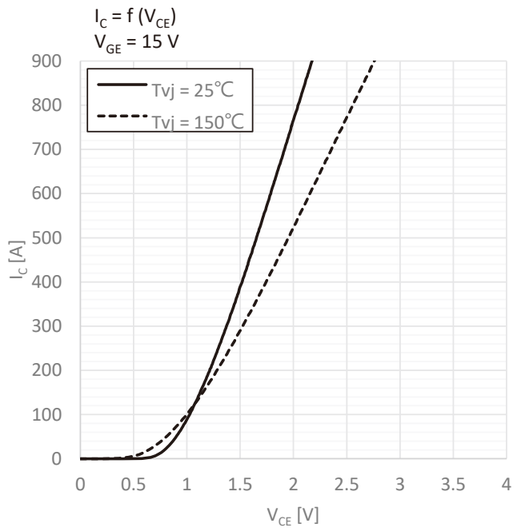
Characteristic value

			min.	typ.	max.	
Rated resistance	Tc = 25°C	R_{25}		5.07		KΩ
Power dissipation	Tc = 25°C	P_{25}			240	mW
B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298, 15K))]$	B_{25}/B_{50}		3412.7		K
B-value	$R_2=R_{25}\exp[B_{25/75}(1/T_2-1/(298, 15K))]$	B_{25}/B_{75}		3454.8		K
B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298, 15K))]$	B_{25}/B_{100}		3442.2		K

NIETZ MG450DA120M0

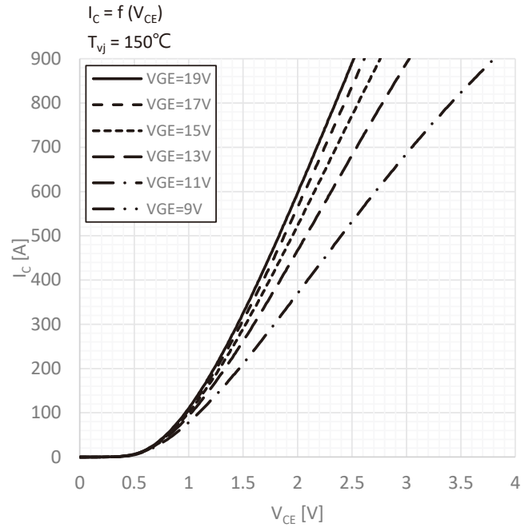
Output characteristic IGBT, Inverter (typical)

$I_C = f(V_{CE})$
V_{GE} = 15 V



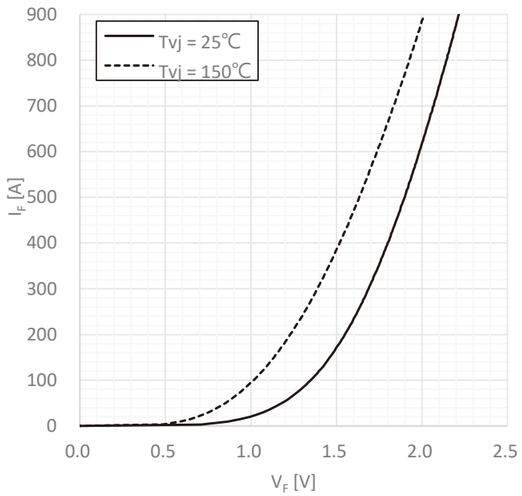
Output characteristic IGBT, Inverter (typical)

$I_C = f(V_{CE})$
T_{vj} = 150°C

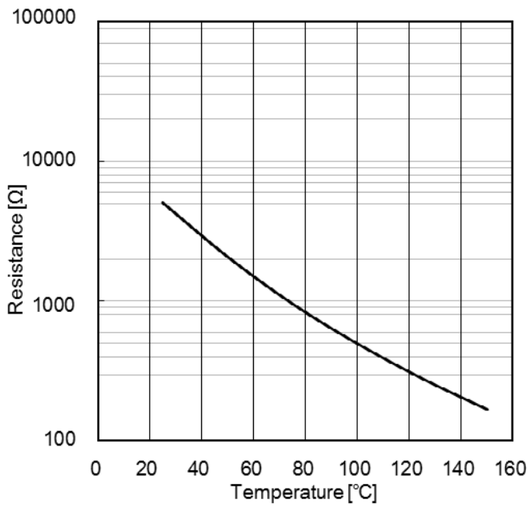


Forward characteristic of Diode, Inverter (typical)

$I_F = f(V_F)$

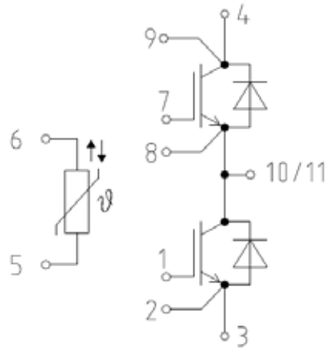


NTC-Thermistor-temperature characteristic (typical) R=f(T)

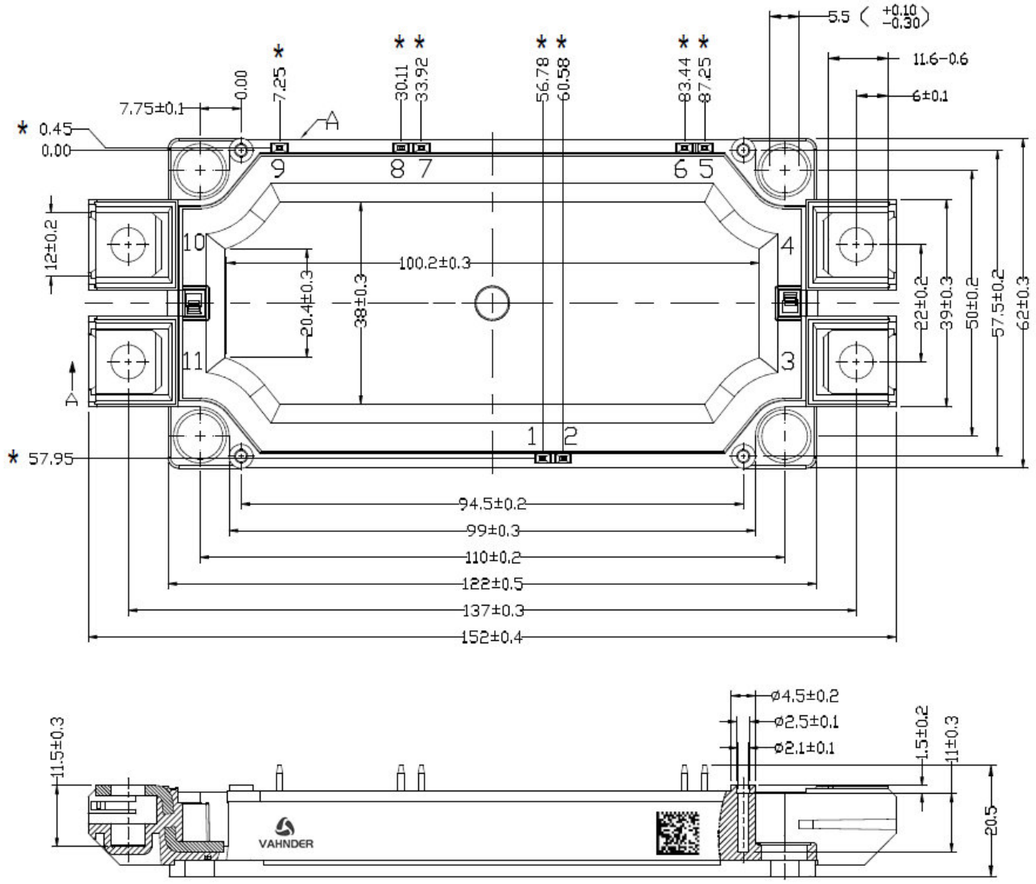


NIETZ	MG450DA120M0

Circuit Diagram



Package outlines



NIETZ

MG450DB120T0
1200V450A Y62 IGBT Module

NIETZ MG450DB120T0

IGBT, Inverter

Maximum Rated Values

Collector-emitter voltage	Tvj = 25°C	V_{CES}		1200	V
Continuous DC collector current	T_C = 100°C, T_{vj} max = 150°C	$I_{C\ nom}$		450	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}		900	A
Total power dissipation	T_C = 25°C, T_{vj} max = 150 ˚C	P_{tot}		3000	W
Gate-emitter peak voltage	T_C = 25°C, T_{vj} max = 150 ˚C	V_{GES}		+/- 20	V

Characteristic value			**min.**	**typ.**	**Max.**	
Collector-emitter saturation voltage	I_C = 450 A, V_{GE} = 15 V T_{vj} = 25°C	$V_{CE,sat}$		1.55	2.15	V
	I_C = 450 A, V_{GE} = 15 V T_{vj} = 125°C			1.75		V
	I_C = 450 A, V_{GE} = 15 V T_{vj} = 150°C			1.8		V
Gate threshold voltage	IC=24.0mA,VCE=VGE,Tj=25℃	$V_{GE,th}$	5.0	6.0	6.5	V
Gate charge	V_{GE} = -15 V ... +15 V	Q_G		11		μC
Internal gate resistor	T_{vj} = 25°C	R_{Gint}		0.8		Ω
Input capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V	C_{ies}		76		nF
Reverse transfer capacitance	f=1MHz, T_{vj}=25°C,V_{CE}=25V, V_{GE}=0V	C_{res}		0.45		nF
Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C	I_{CES}		0.005	0.12	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C	I_{GES}		6	100	nA
Turn-on delay time, inductive load	I_C = 450A, V_{CE} = 600V T_{vj} = 25°C V_{GE} = +15/-15V T_{vj} = 125°C $R_{G,on}$ = 2Ω T_{vj} = 150°C	$T_{d,on}$		381 390 410		ns ns ns
Rise time, inductive load	I_C = 450A, V_{CE} = 600V V_{GE} = +15/-15V $R_{G,on}$ = 2Ω T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	T_r		51 58 60		ns ns ns
Turn-off delay time, inductive load	I_C = 450A, V_{CE} = 600V V_{GE} = +15/-15V T_{vj} = 25°C R_{Goff} = 2Ω T_{vj} = 125°C T_{vj} = 150°C	$T_{d,off}$		530 596 620		ns ns ns
Fall time, inductive load	I_C = 450A, V_{CE} = 600V T_{vj} = 25°C	T_f		130		ns

	V_{GE} = +15/-15V T_{vj} = 125°C R_{Goff} = 2Ω T_{vj} = 150°C			270 320		ns ns
Turn-on energy loss per pulse	I_C =450A, V_{CE} = 600V, V_{GE} = +15/-15V, di/dt T_{vj} = 25°C =6500A/μs T_{vj} = 125°C (T_{vj} = 150°C), R_{Gon} = 2Ω T_{vj} = 150°C	E_{on}		16 25 29		mJ mJ mJ
Turn-off energy loss per pulse	I_C = 450A, V_{CE} = 600V, V_{GE} =+15/-15V, dv/dt T_{vj} = 25°C =TBDV/μs T_{vj} = 125°C (T_{vj} = 150°C), R_{Goff} = 2Ω T_{vj} = 150°C	E_{off}		39 62 68		mJ mJ mJ
SC data	V_{GE} ≤15V, V_{CC} =600 V, t_P ≤ 8 μs, T_{vj} = 150°C , R_G =5Ω , C_{GE} = 0.0uF , V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	I_{SC}		1600		A
Thermal resistance, junction to case	per IGBT, grease = 1.3 W/(m·K)	$R_{th,JC}$		0.0976		K/W

Diode

Maximum Rated Values

Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1200	V
Continuous DC forward current		I_F	450	A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}	900	A
I^2t - value	V_R = 0 V, t_P = 10 ms, T_{vj} = 125°C	I^2t	14500	A^2s

Characteristic value

				min.	typ.	Max.	
Forward voltage	I_C = 450 A, V_{GE} = 0 V T_{vj} = 25°C I_C = 450 A, V_{GE} = 0V T_{vj} = 125°C I_C = 450 A, V_{GE} = 0 V T_{vj} = 150°C	V_F			1.85 1.75 1.7		V V V
Peak reverse recovery current	I_F = 450A, -di$_F$/dt T_{vj} = 25°C =6500A/μs T_{vj} = 125°C (T_{vj} = 150°C), V_R = T_{vj} = 150°C 600V V_{GE} = -15V	I_{RM}			330 480 500		A
Recovered charge	I_F = 450A, -di$_F$/dt T_{vj} = 25°C =6500A/μs T_{vj} = 125°C	Q_r			40 66		μC

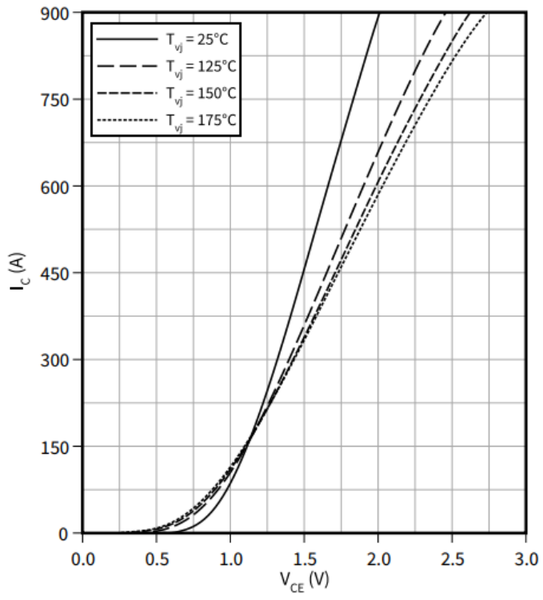
	(T_{vj} = 150°C), V_R = T_{vj} = 150°C 600V V_{GE} = -15V			79		
Reverse recovery energy	I_F = 450A, -di$_F$/dt T_{vj} = 25°C =6500A/μs T_{vj} = 125°C (T_{vj} = 150°C), V_R = T_{vj} = 150°C 600V V_{GE} = -15V	E_{rec}		20 35 39		mJ
Thermal resistance, junction to case	Per diode, grease = 1.3 W/(m·K)	$R_{th,JC}$			0.140	K/W

特征参数图表

输出特性

IC = f(VCE)

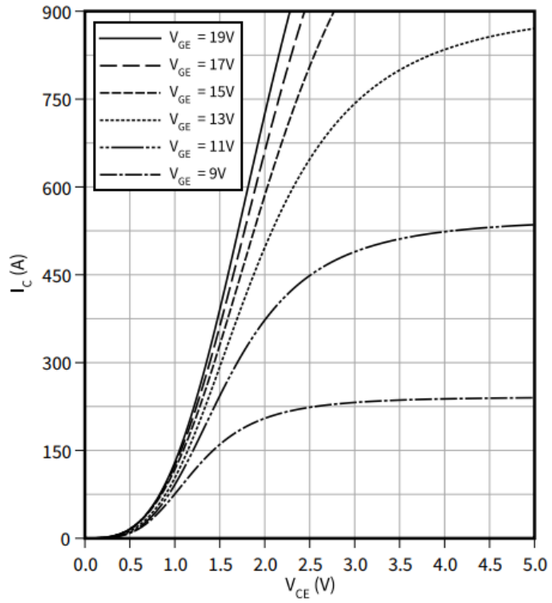
VGE = 15 V



输出特性

IC = f(VCE)

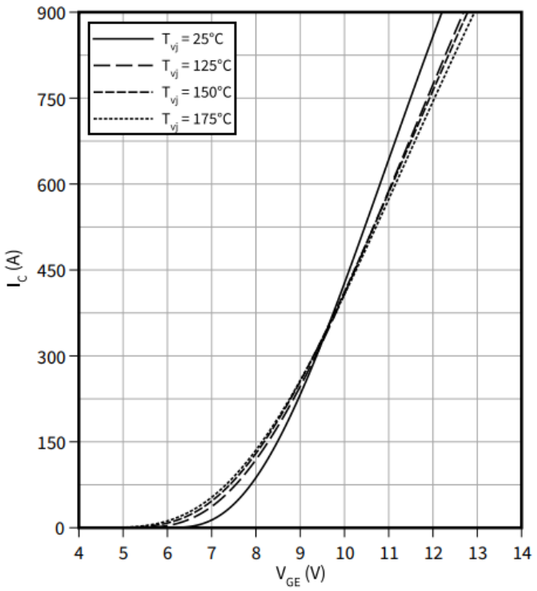
Tvj = 150°C



传输特性

IC = f(VGE)

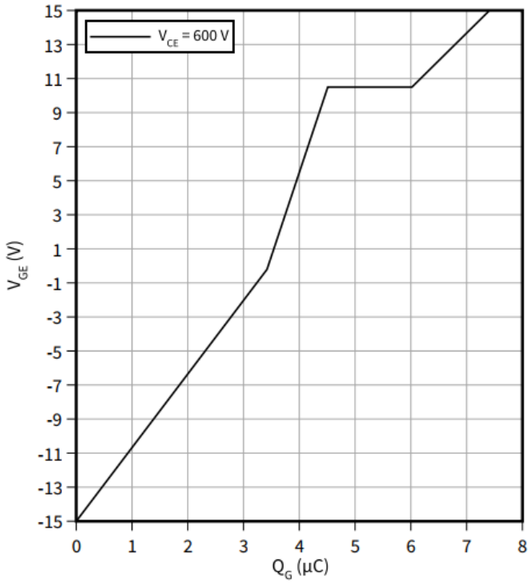
VCE = 20 V



栅极电荷特性

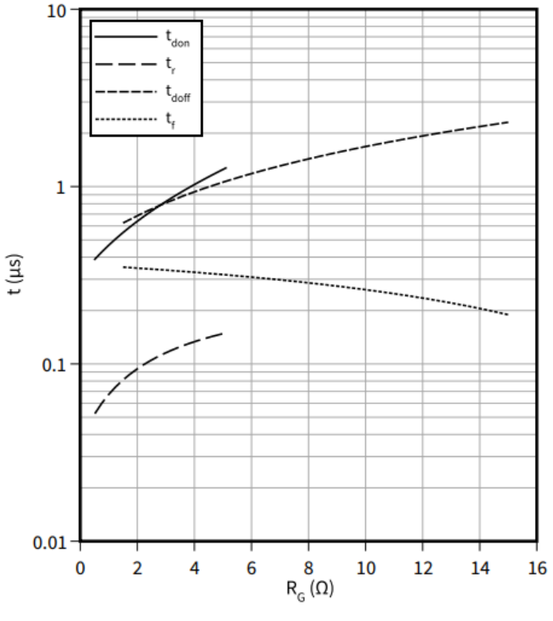
VGE = f(QG)

IC = 450 A, Tvj = 25 ℃



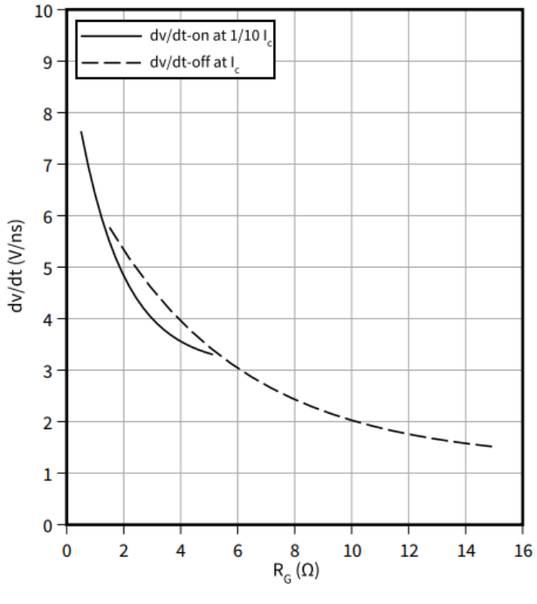
开关时间

t = f(RG)IC = 450 A, VCC = 450 V, VGE = ± 15 V, Tvj = 150℃



电压变化斜率

dv/dt = f(RG)IC = 450 A, VCC = 600 V, VGE = ±15 V, Tvj = 25℃



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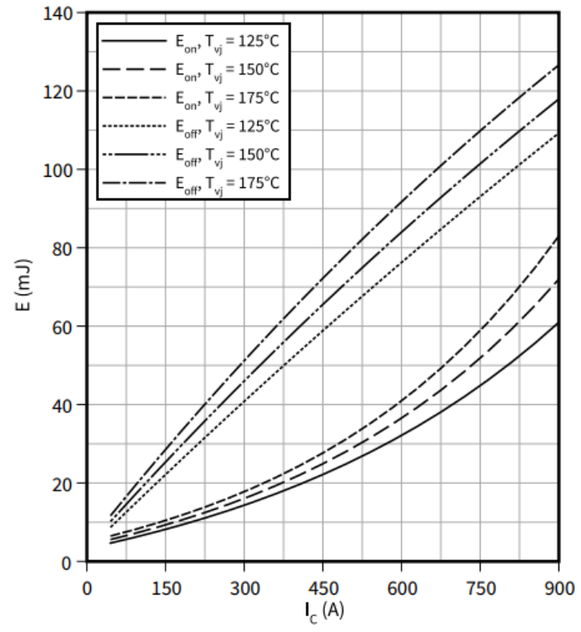
NIETZ MG450DB120T0

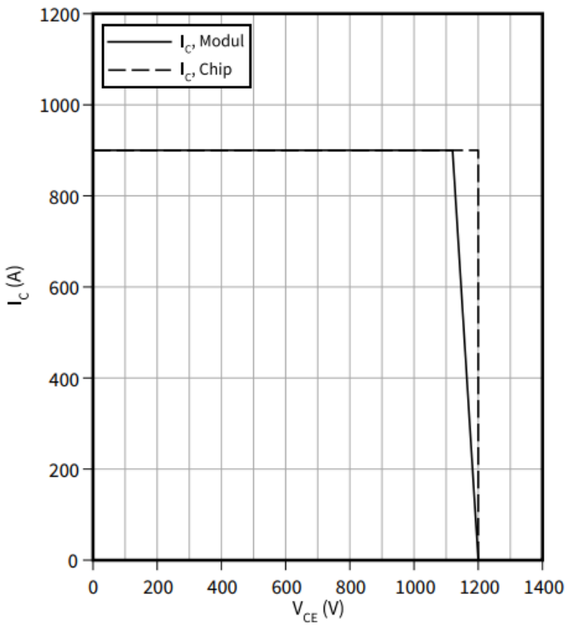
开关损耗

RGoff =2Ω, RGon =2Ω, VCC = 600 V, VGE = ± 15 V



反偏安全工作区

RGoff =2Ω, VGE = ±15 V, Tvj = 150℃



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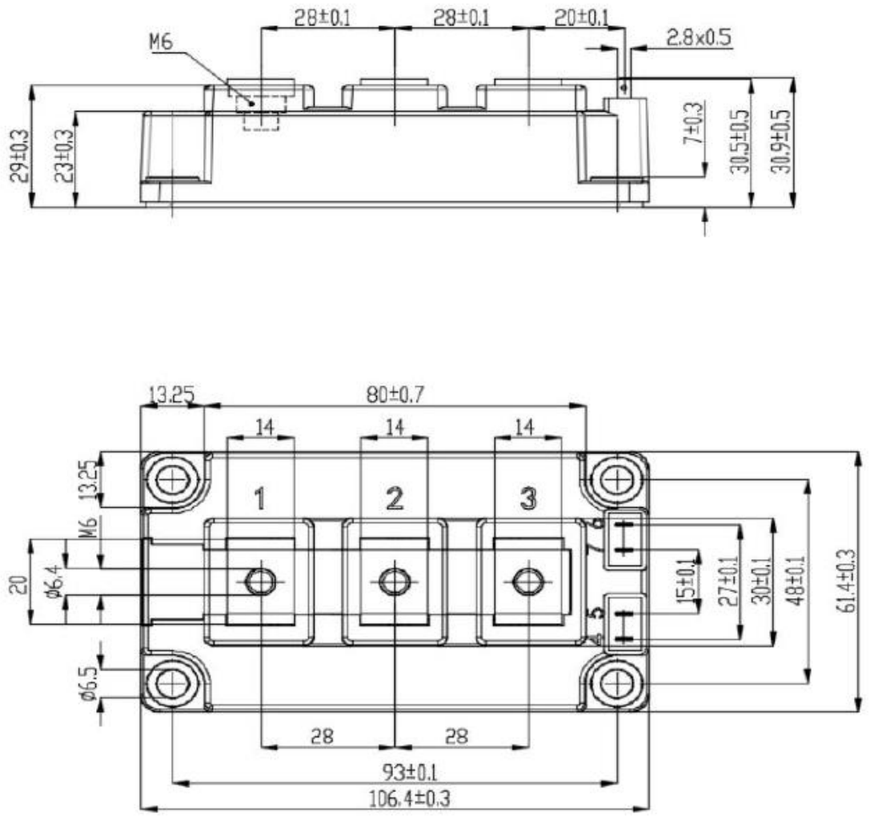
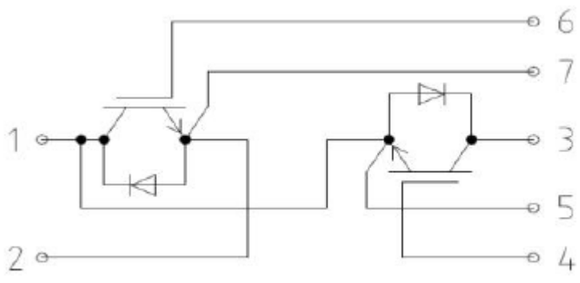
NIETZ	MG150PB120K1

Package outlines



Circuit Diagram



HOW TO ORDER

MG 075 PA 120 K0 X

① Module Type
② Current Rating
③ Circuit Type
④ Voltage
⑤ Package Type
⑥ Customized Code

① **Module Type:** MG: IGBT Module
MS: Si MOS
MC: SiC MOS
MH: Hybrid IGBT

④ **Voltage:** 120: Vecs= 1200V
170: Vecs= 1700V
065: Vecs= 650V
075: Vecs= 750V
330: Vecs= 3300V

② **Current Rating :** 050: Ic=50A
075: Ic=75A
100: Ic=100A
150: Ic=150A
200: Ic=200A
300: Ic=300A
450: Ic=450A

⑤ **Package Type:** K0: Econopack3 2Pin
K1: Econopack3 3Pin
K6: Econopack3 6-in-One package
M0: EconoDual3
N0: Econopack2
A0: Hybrid Pack Drive
AL: Hybrid Pack Drive Long Tab
A1: Hybrid Pack1
T0 : 62mm
T1 : 34mm
W1: Easy Pack 1B
W2: Easy Pack 2B
W3: Easy Pack 3B
W4: Easy Pack 4B
C0: DCM-1000

③ **Circuit Type :** PA: 3 Phase Bridge+Brake
PB: 3 Phase Bridge
DA: Dual/Half Bridge
DB: Half Bridge without Rectifier
FA: Fourpack
ZA: Single Switch
SA: Sixpack