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

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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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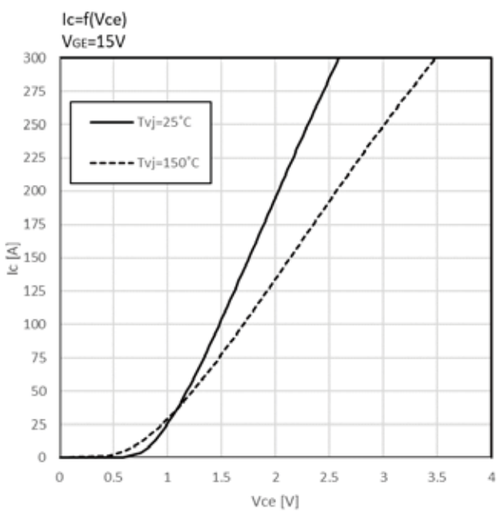
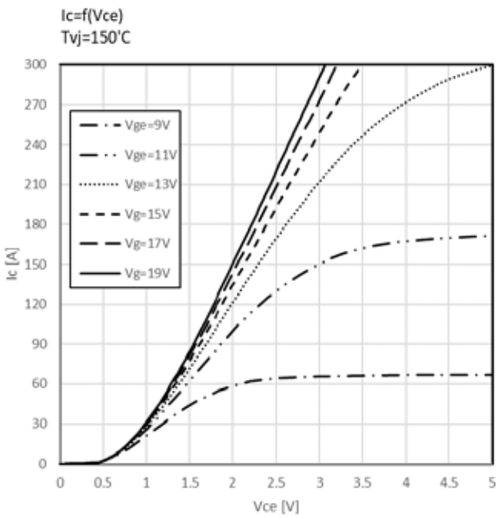
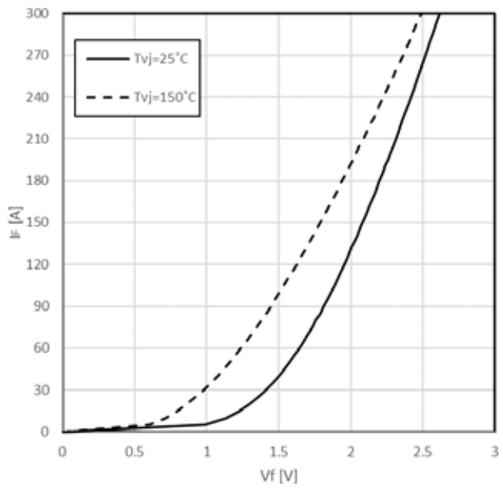
Output characteristic IGBT, Inverter (typical)



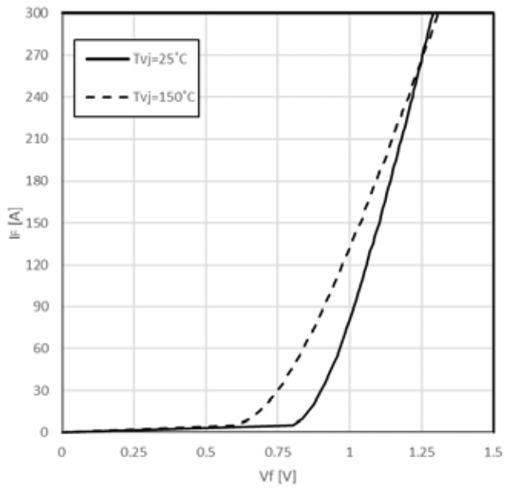
Output characteristic IGBT, Inverter (typical)



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



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



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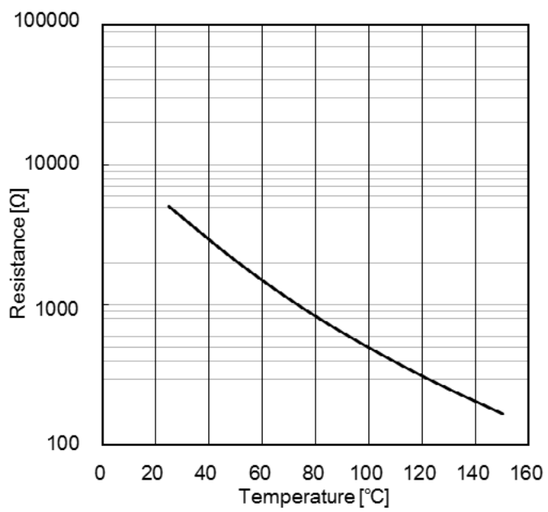
NTC-Thermistor-temperature characteristic (typical) R=f(T)



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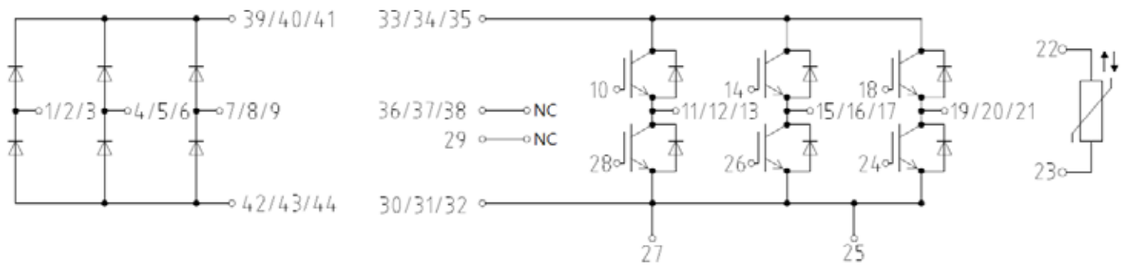
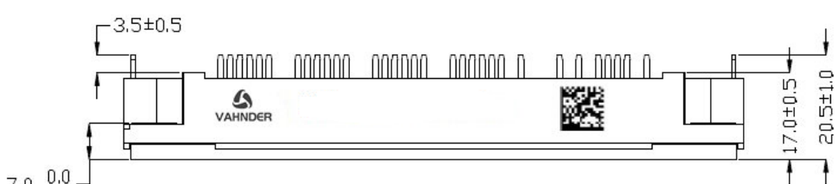
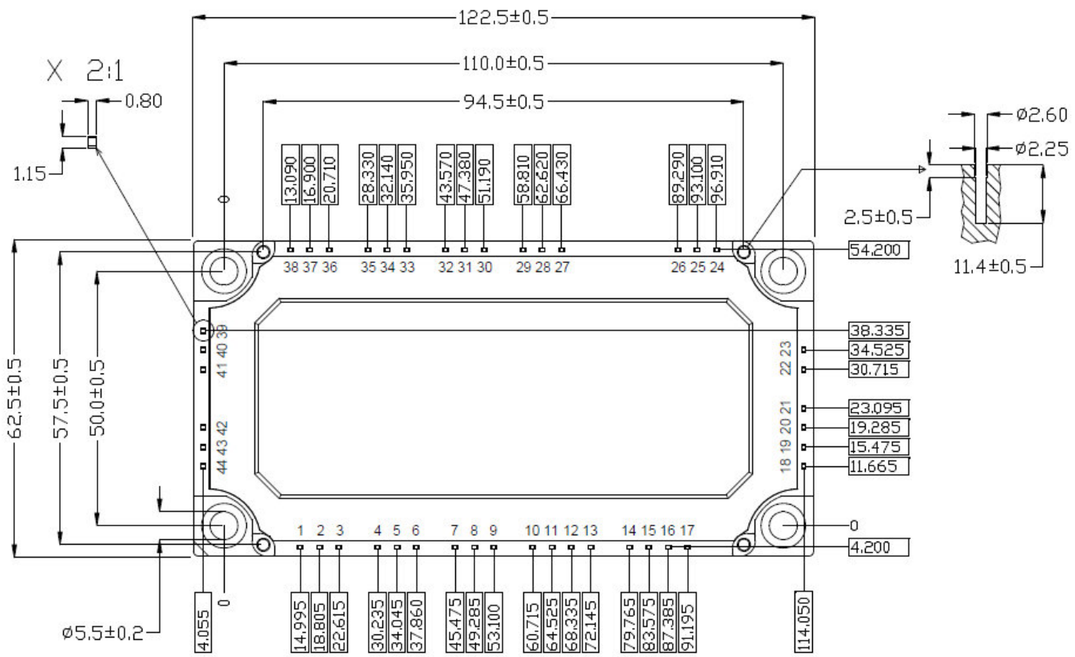
Circuit Diagram



Package outlines





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