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	$T_{d,on}$				us
	V_{GE} = +15/-15V	T_{vj} = 125°C					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	T_r				us
	V_{GE} = +15/-15V	T_{vj} = 125°C					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	$T_{d,off}$				us
	V_{GE} = +15/-15V	T_{vj} = 125°C					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	T_f				us
	V_{GE} = +15/-15V	T_{vj} = 125°C					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	E_{on}				mJ
	V_{GE} = +15/-15V,	T_{vj} = 125°C					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

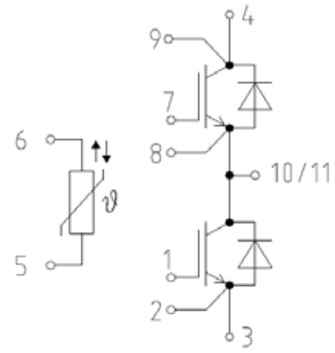
			min.	typ.	max.	
Forward voltage	I_F = 300 A, V_{GE} = 0 V T_{vj} = 25°C	V_F		2.0		V
	I_F = 300 A, V_{GE} = 0 V T_{vj} = 125°C					V
	I_F = 300 A, V_{GE} = 0 V T_{vj} = 150°C					V
Peak reverse recovery current	I_F = 300A, V_R = 600V T_{vj} = 25°C	I_{RM}				A
	V_{GE} = -15V T_{vj} = 125°C					
	T_{vj} = 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