



IGBT Modules

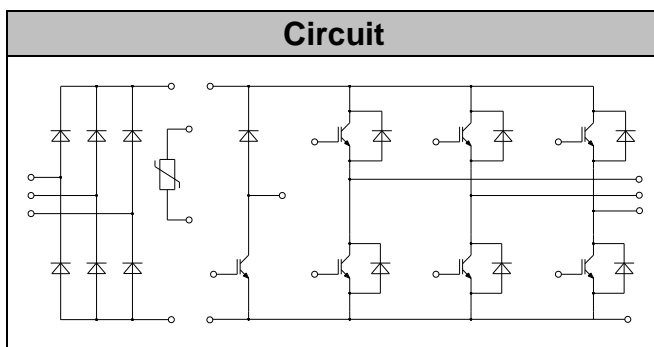
V_{CES} 1200V
I_C 75A

Applications

- Motor Drivers
- AC and DC servo drive amplifier
- UPS (Uninterruptible Power Supplies)

Features

- Low switching losses
- Low $V_{ce(sat)}$ with positive temperature coefficient
- Including fast & soft recovery anti-parallel FWD
- Low inductance case
- High short circuit capability(10us)
- Maximum junction temperature 175



● IGBT- inverter

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	$V_{GE}=0V, I_C=1mA, T_{vj}=25$	1200	V
Continuous Collector Current	I_C	$T_c=80, T_{vjmax}=175$	75	A
Repetitive Peak Collector Current	I_{CRM}	$tp=1ms$	150	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25$	± 20	V
Total Power Dissipation	P_{tot}	$T_c=25$ $T_{vjmax}=175$	476	W



● IGBT- inverter

Characteristic values

Parameter	Symbol	Conditions	Value			Unit	
			Min.	Typ.	Max.		
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=3mA, T_{vj}=25$	5.0	5.8	6.5	V	
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25$			1.0	mA	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=75A, V_{GE}=15V, T_{vj}=25$		1.85	2.15	V	
		$I_C=75A, V_{GE}=15V, T_{vj}=125$		2.05			
		$I_C=75A, V_{GE}=15V, T_{vj}=150$		2.10			
Gate Charge	Q_G			0.85		uC	
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz, T_{vj}=25$		4.20		nF	
Reverse Transfer Capacitance	C_{res}			0.32		nF	
Internal Gate Resistance	R_{gint}			10			
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25$			400	nA	
Turn-on Delay Time	$t_{d(on)}$	$I_C=75A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=5.1\Omega$ $T_{vj}=25$		100		ns	
Rise Time	t_r			78		ns	
Turn-off Delay Time	$t_{d(off)}$				380	ns	
Fall Time	t_f				32	ns	
Energy Dissipation During Turn-on Time	E_{on}				5.6	mJ	
Energy Dissipation During Turn-off Time	E_{off}				3.6	mJ	
Turn-on Delay Time	$t_{d(on)}$		$I_C=75A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=5.1\Omega$ $T_{vj}=125$		110		ns
Rise Time	t_r					85	ns
Turn-off Delay Time	$t_{d(off)}$				450	ns	
Fall Time	t_f				36	ns	
Energy Dissipation During Turn-on Time	E_{on}				8.8	mJ	
Energy Dissipation During Turn-off Time	E_{off}				6.4	mJ	
SC Data	I_{sc}	$T_p \leq 10\mu s, V_{GE}=15V, T_{vj}=150$, $V_{cc}=900V, V_{CEM} \leq 1200V$			370		A



● Diode-inverter

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	$T_{vj}=25$	1200	V
Continuous DC Forward Current	I_F		75	A
Repetitive Peak Forward Current	I_{FRM}	$t_p=1\text{ms}$	150	A
I^2t -value	I^2t	$V_R=0, t_p=10\text{ms}, T_{vj}=125$	810	A ² s
		$V_R=0, t_p=10\text{ms}, T_{vj}=150$	690	

Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F=75\text{A}, T_{vj}=25$		1.95	2.25	V
		$I_F=75\text{A}, T_{vj}=125$		2.05		
		$I_F=75\text{A}, T_{vj}=150$		2.10		
Recovered Charge	Q_{rr}	$I_F=75\text{A}$		4.2		uC
Peak Reverse Recovery Current	I_{rr}	$V_R=600\text{V}$ $-di_F/dt=900\text{A/us}$		75		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=25$		2.06		mJ
Recovered Charge	Q_{rr}	$I_F=75\text{A}$		9.6		uC
Peak Reverse Recovery Current	I_{rr}	$V_R=600\text{V}$ $-di_F/dt=900\text{A/us}$		92		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=125$		4.34		mJ



● IGBT-brake-chopper Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	$V_{GE}=0V, I_C=1mA, T_{vj}=25$	1200	V
Continuous Collector Current	I_C	$T_c=100, T_{vjmax}=175$	35	A
Repetitive Peak Collector Current	I_{CRM}	$t_p=1ms$	70	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25$	± 20	V
Total Power Dissipation	P_{tot}	$T_c=25$ $T_{vjmax}=175$	300	W

Characteristic values

Parameter	Symbol	Conditions	Value			Unit	
			Min.	Typ.	Max.		
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=1.2mA, T_{vj}=25$	5.2	5.8	6.4	V	
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25$			1.0	mA	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=40A, V_{GE}=15V, T_{vj}=25$		1.95	2.35	V	
		$I_C=40A, V_{GE}=15V, T_{vj}=125$		2.30			
		$I_C=40A, V_{GE}=15V, T_{vj}=150$		2.40			
Gate Charge	Q_G			0.27		uC	
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$		2.00		nF	
Reverse Transfer Capacitance	C_{res}	$f=1MHz, T_{vj}=25$		0.07		nF	
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25$			400	nA	
Turn-on Delay Time	$t_{d(on)}$	$I_C=35A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=13\Omega$ $T_{vj}=25$		45		ns	
Rise Time	t_r				35		ns
Turn-off Delay Time	$t_{d(off)}$				300		ns
Fall Time	t_f				55		ns
Energy Dissipation During Turn-on Time	E_{on}				3.3		mJ
Energy Dissipation During Turn-off Time	E_{off}				1.8		mJ



MG75P12E2A **RoHS** COMPLIANT

Turn-on Delay Time	$t_{d(on)}$	$I_C = 35\text{ A}$ $V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_G = 13\Omega$ $T_{vj} = 125$		50		ns
Rise Time	t_r			40		ns
Turn-off Delay Time	$t_{d(off)}$			380		ns
Fall Time	t_f			80		ns
Energy Dissipation During Turn-on Time	E_{on}			4.2		mJ
Energy Dissipation During Turn-off Time	E_{off}			2.7		mJ



● Diode-Rectifier

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	$T_j=25$	1600	V
Average output Current 50/60Hz, sine wave	$I_{F(AV)}$	$T_c=100$	80	A
Maximum RMS Current at Rectifier Output	I_{RMSM}	$T_c=100$	120	A
Surge Forward Current	I_{FSM}	$V_R=0, t_p=10ms, T_j=45$	1100	A
I^2t -value	I^2t	$V_R=0, t_p=10ms, T_j=45$	6050	A ² s

Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Diode Forward Voltage	V_F	$I_F=50A, T_j=125$		0.98		V
Reverse Current	I_R	$T_j=125, V_R=1600V$			2.0	mA

● NTC-Thermistor

Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Rated Resistance	R_{25}			5.0		k
Deviation of R100	R/R	$T_c=100, R_{100}=493.3$	-5		5	%
Power Dissipation	P_{25}				20.0	mW
B-value	$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15 K))]$		3375		K



● Module Characteristics

T_C=25°C unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V _{isol}	t=1min,f=50Hz	2500			V

