



IGBT Module 1200V / 75A

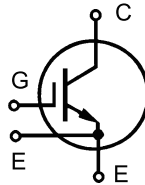
Features

- ◆ Fast Switching Trench / Field Stop IGBT Technology
- ◆ Low Switching Losses
- ◆ High Short Circuit Capability

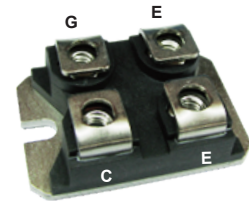
Applications

- ◆ Welder / Power Supply
- ◆ UPS / Inverter
- ◆ Industrial Motor Drive

Preliminary

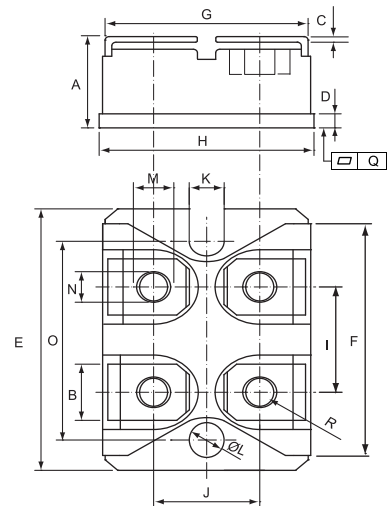


SOT-227



G = Gate, C = Collector, E = Emitter

Dimensions in inches and (millimeters)



Maximum Ratings ($T_c = 25^\circ\text{C}$)

Item	Symbol	Rated Value	Unit
Collector-Emitter Voltage	V_{CES}	1200	V
Gate-Emitter Voltage	V_{GES}	± 20	V
DC-Collector Current $T_c = 80^\circ\text{C}$	$I_{C,nom.}$	75	A
Repetitive Peak Collector Current $t_p = 1\text{ms}$	I_{CRM}	150	A
Total Power Dissipation	P_{tot}	400	W
Isolation Voltage (A.C. 1 minute) between All Terminals and Baseplate	V_{iso}	2500	V
Junction Temperature Range	T_J	$-40 \sim +150$	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-40 \sim +125$	$^\circ\text{C}$
Mounting Torque (M4 screw)	M_d	To heatsink 1.3 To terminals 1.1	N.m

	DIMENSIONS			
	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.460	0.483	11.68	12.28
B	0.307	0.323	7.80	8.20
C	0.030	0.033	0.75	0.85
D	0.071	0.081	1.80	2.05
E	1.488	1.504	37.80	38.20
F	1.248	1.260	31.70	32.00
G	0.917	0.957	23.30	24.30
H	0.996	1.008	25.30	25.60
I	0.579	0.602	14.70	15.30
J	0.492	0.516	12.50	13.10
K	0.161	0.169	4.10	4.30
L	0.161	0.169	4.10	4.30
M	0.181	0.197	4.60	5.00
N	0.165	0.181	4.20	4.60
O	1.181	1.197	30.00	30.40
Q	-0.002	0.004	-0.05	0.10
R	M4*8			



■ **Electrical Characteristics** ($T_{VJ} = 25^{\circ}\text{C}$)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector-Emitter Cut-Off Current	I_{CES}	$V_{CE} = 1200\text{V}$ $V_{GE} = 0\text{V}$	-	10	500	μA
Gate-Emitter Leakage Current	I_{GES}	$V_{GE} = 20\text{V}$ $V_{CE} = 0\text{V}$	-	-	400	nA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 75\text{A}, V_{GE} = 15\text{V}$	-	1.9	2.2	V
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C = 4\text{mA}$	4.5	5.5	6.5	V
Input Capacitance	C_{ies}	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$	-	9.5	-	nF
Output Capacitance	C_{oes}	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$	-	0.16	-	nF
Reverse Transfer Capacitance	C_{res}	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$	-	0.14	-	nF
Switching Time	Rise Time	t_r	-	0.036	-	μs
	Turn-On Time	$t_{d,on}$	-	0.120	-	
	Fall Time	t_f	-	0.096	-	
	Turn-Off Time	$t_{d,off}$	-	0.213	-	
Turn-on Energy Loss Per Pulse	E_{on}	$I_C = 75\text{A}, V_{CC} = 600\text{V}$ $V_{GE} = 15\text{V}, R_G = 1\Omega$	-	0.47	-	mJ
Turn-off Energy Loss Per Pulse	E_{off}	Inductive load	-	4.36	-	mJ
External Gate Resistance	R_G	Per Switch	1	-	10	Ω

■ **Thermal Characteristics** ($T_C = 25^{\circ}\text{C}$)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Thermal Impedance	$R_{th(j-c)}$	Junction to Case	-	-	0.30	$^{\circ}\text{C/W}$



Typical Characteristics

Preliminary Data

Fig.1 Output characteristic (Typical)

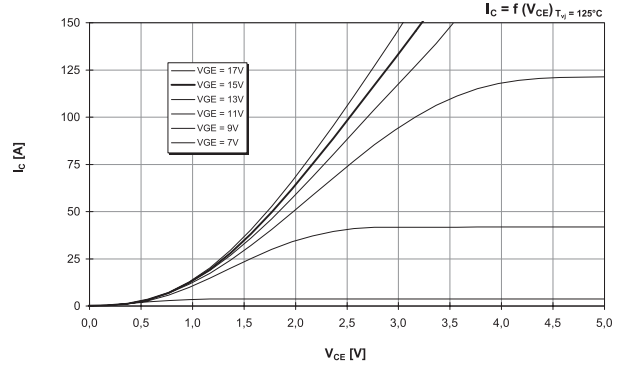
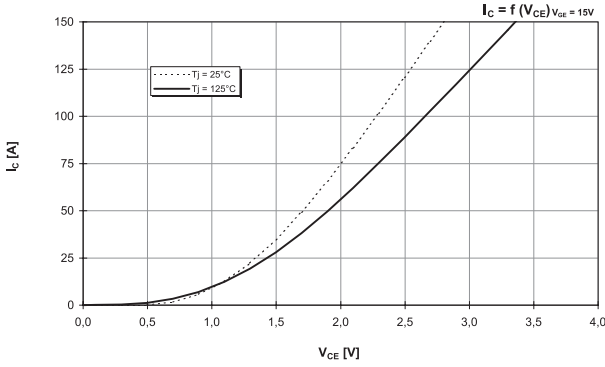


Fig.2 Transfer characteristic (Typical)

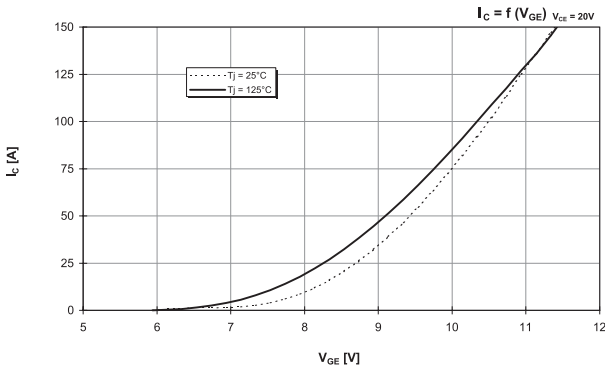


Fig.3 Reverse bias safe operation area (RBSOA)

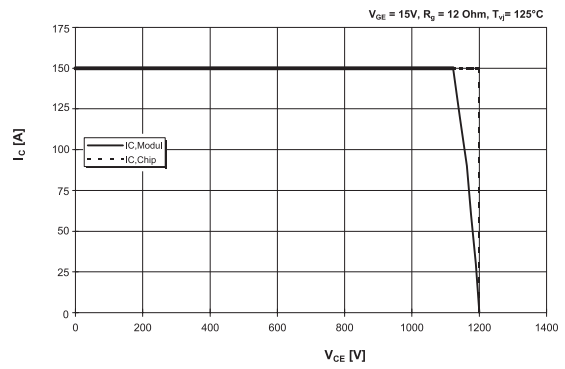


Fig.4 Switching losses (Typical)

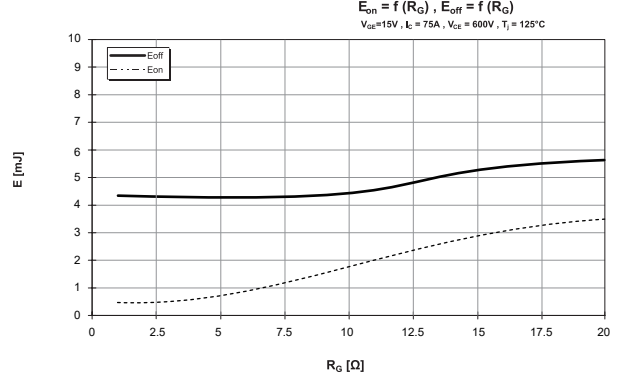
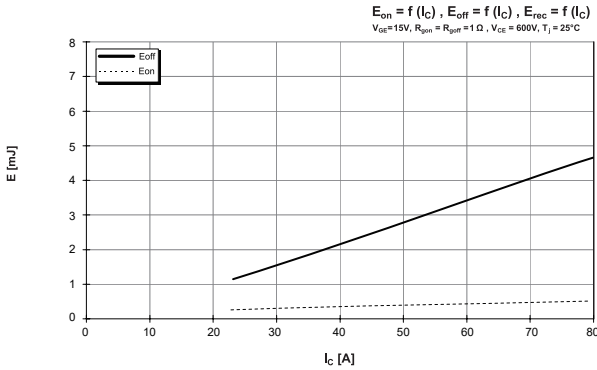
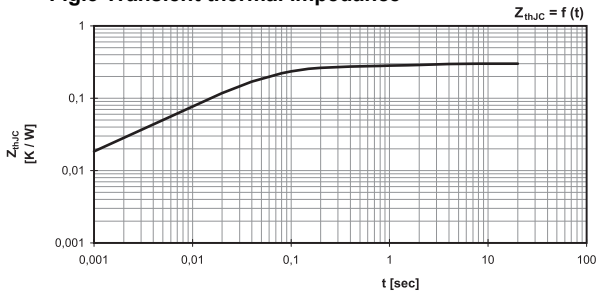


Fig.5 Transient thermal impedance



i	1	2	3	4
r_i [K/kW] : IGBT	20,13	60,93	79,4	19,54
τ_i [sec] : IGBT	0,002	0,03	0,066	1,655



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