



IGBT Module 1200V / 100A

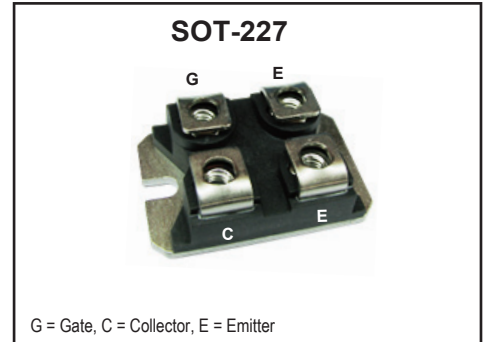
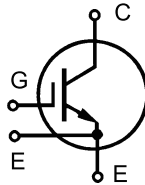
Features

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

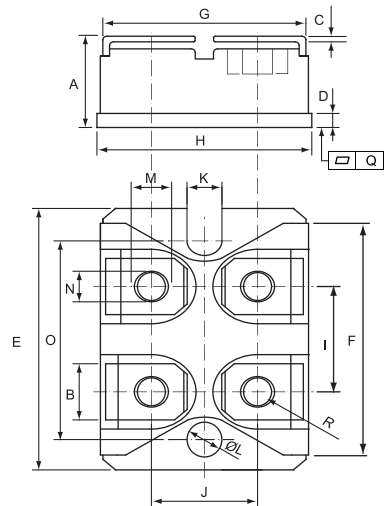
Applications

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

Preliminary



Dimensions in inches and (millimeters)



Maximum Ratings (T_c = 25°C)

Item	Symbol	Rated Value	Unit
Collector-Emitter Voltage	V _{CES}	1200	V
Gate-Emitter Voltage	V _{GES}	±20	V
DC-Collector Current	I _{C,nom.}	T _c = 25°C 180	A
		T _c = 80°C 100	
		T _c = 110°C 88	
Repetitive Peak Collector Current	I _{CRM}	200	A
Total Power Dissipation	P _{tot}	625	W
Isolation Voltage (A.C. 1 minute) between All Terminals and Baseplate	V _{iso}	2500	V
Junction Temperature Range	T _J	-40~+150	°C
Storage Temperature Range	T _{stg}	-40~+125	°C
Mounting Torque (M4 screw)	M _d	To heatsink 1.3	N.m
		To terminals 1.1	

	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	15	μA
Gate-Emitter Leakage Current	I_{GES}	$V_{GE}=20\text{V}$ $V_{CE}=0\text{V}$	-	-	400	nA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=100\text{A}$, $V_{GE}=15\text{V}$	-	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}	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$	-	15	-	nF
Output Capacitance	C_{oes}	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$	-	0.24	-	nF
Reverse Transfer Capacitance	C_{res}	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$	-	0.20	-	nF
Switching Time	Rise Time	$V_{CC}=600\text{V}$ $I_C=100\text{A}$ $R_G=1\Omega$ $V_{GE}=\pm 15\text{V}$ $T_{VJ}=25^{\circ}\text{C}$	-	0.040	-	μs
	Turn-On Time		-	0.170	-	
	Fall Time		-	0.090	-	
	Turn-Off Time		-	0.267	-	
Switching Time	Rise Time	$V_{CC}=600\text{V}$ $I_C=100\text{A}$ $R_G=1\Omega$ $V_{GE}=\pm 15\text{V}$ $T_{VJ}=125^{\circ}\text{C}$	-	0.044	-	μs
	Turn-On Time		-	0.177	-	
	Fall Time		-	0.186	-	
	Turn-Off Time		-	0.327	-	
Turn-on Energy Loss Per Pulse	E_{on}	$I_C=100\text{A}$, $V_{CC}=600\text{V}$ $V_{GE}=15\text{V}$, $R_G=1\Omega$	-	0.73	-	mJ
Turn-off Energy Loss Per Pulse	E_{off}	Inductive load, $T_{VJ}=25^{\circ}\text{C}$	-	6.09	-	
Turn-on Energy Loss Per Pulse	E_{on}	$I_C=100\text{A}$, $V_{CC}=600\text{V}$ $V_{GE}=15\text{V}$, $R_G=1\Omega$	-	1.269	-	mJ
Turn-off Energy Loss Per Pulse	E_{off}	Inductive load, $T_{VJ}=125^{\circ}\text{C}$	-	8.20	-	
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	-	-	0.20	$^{\circ}\text{C/W}$



Typical Characteristics

Preliminary Data

Fig.1 Output characteristic (Typical)

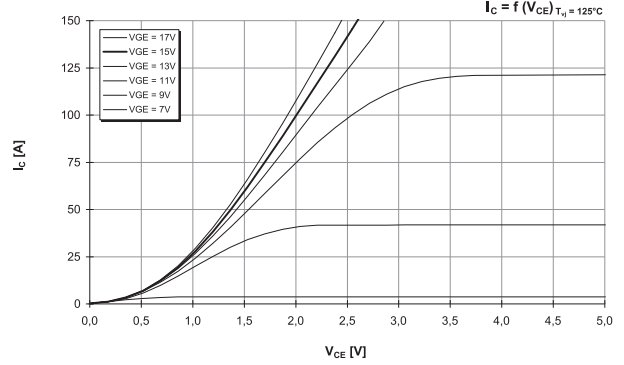
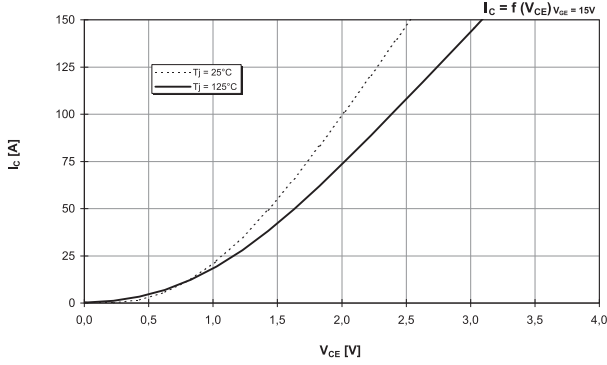


Fig.2 Transfer characteristic (Typical)

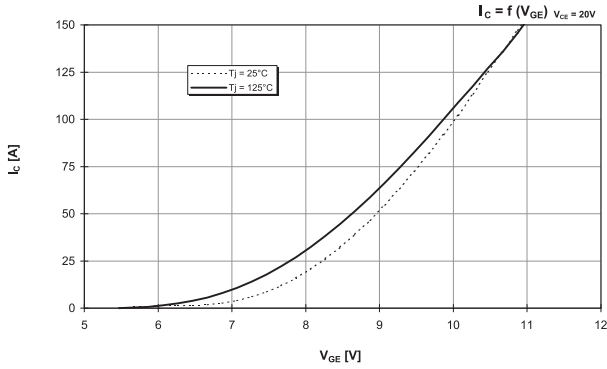


Fig.3 Reverse bias safe operation area (RBSOA)

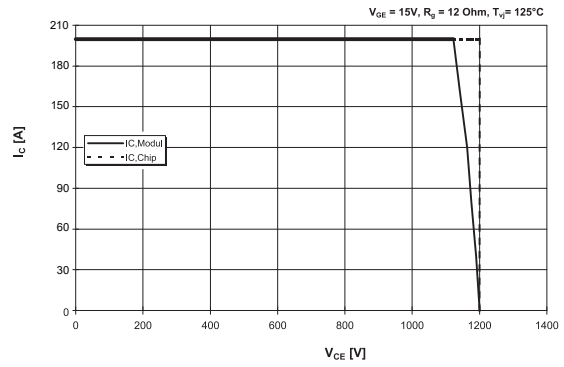


Fig.4 Switching losses (Typical)

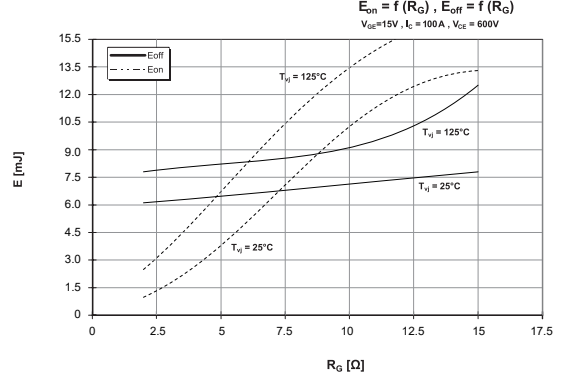
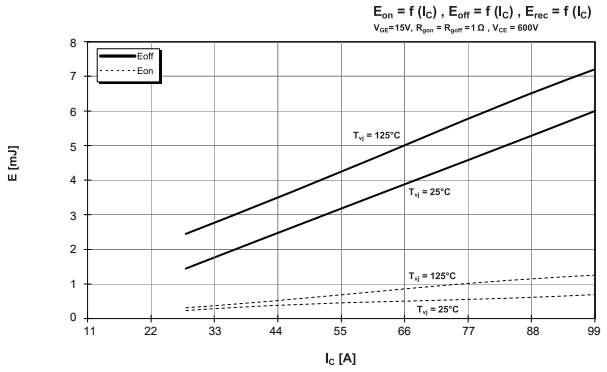
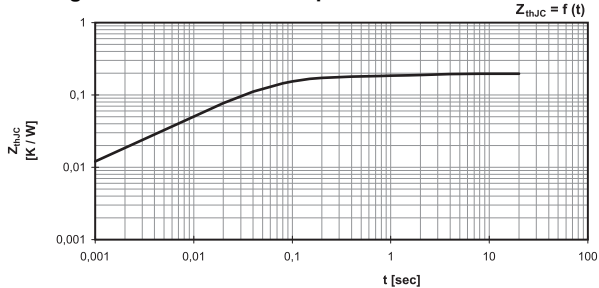


Fig.5 Transient thermal impedance





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