



# IGBT Module 1200V / 100A

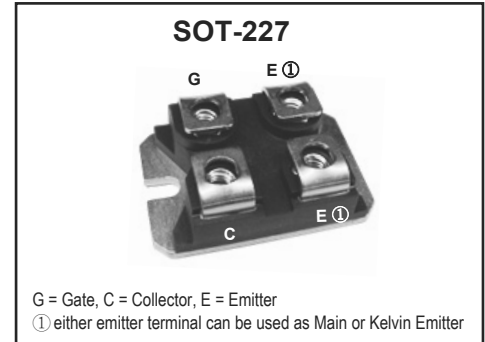
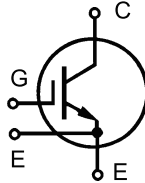
## Features

- ◆ Fast switching field stop IGBT trench technology
- ◆ Low switching loss
- ◆ High short circuit capability

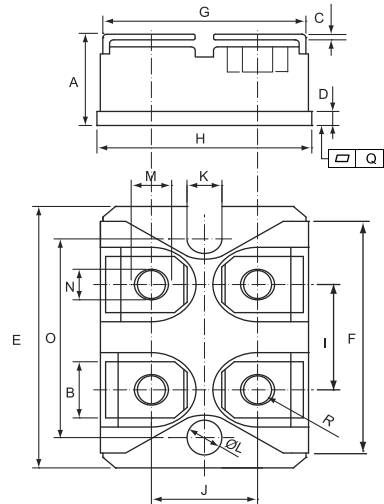
## Applications

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

Preliminary



Dimensions in inches and (millimeters)



## Maximum Ratings (T<sub>C</sub>=25°C)

Item	Symbol	Rated Value	Unit
Collector-Emitter Voltage	V <sub>CES</sub>	1200	V
Gate-Emitter Voltage	V <sub>GES</sub>	±20	V
DC-Collector Current T <sub>C</sub> = 80°C	I <sub>C,nom.</sub>	100	A
Repetitive Peak Collector Current t <sub>p</sub> = 1ms	I <sub>CRM</sub>	200	A
Total Power Dissipation	P <sub>tot</sub>	450	W
Isolation Voltag (e Terminal to Base, AC 1 min.)	V <sub>iso</sub>	2500	V
Junction Temperature Range	T <sub>J</sub>	-40~+150	°C
Storage Temperature Range	T <sub>stg</sub>	-40~+125	°C
Mounting Torque ( M4 screw )	M <sub>d</sub>	1.3	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	$\mu\text{A}$
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	$V_{CC} = 600\text{V}$ $I_C = 100\text{A}$ $R_G = 1\Omega$ $V_{GE} = \pm 15\text{V}$	-	0.037	-	$\mu\text{s}$
	Turn-On Time		-	0.048	-	
	Fall Time		-	0.090	-	
	Turn-Off Time		-	0.267	-	
Turn-on Energy Loss Per Pulse	$E_{on}$	$I_C = 100\text{A}$ , $V_{CC} = 600\text{V}$ $V_{GE} = 15\text{V}$ , $R_G = 1\Omega$	-	0.25	-	mJ
Turn-off Energy Loss Per Pulse	$E_{off}$	Inductive load	-	7.8	-	mJ
External Gate Resistance	$R_G$	Per Switch	1	5.1	27	$\Omega$

■ **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	-	-	0.27	$^{\circ}\text{C/W}$



Typical Characteristics

Preliminary Data

Fig.1 Output characteristic (Typical)

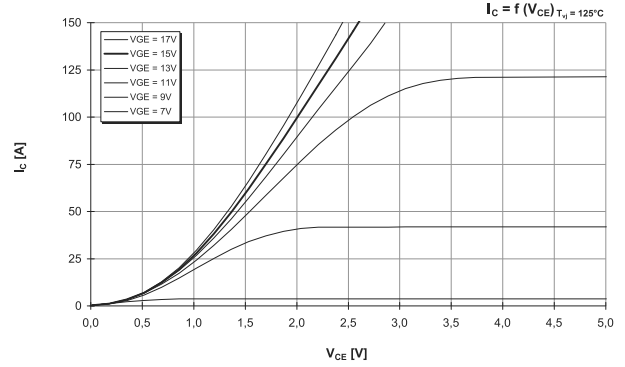
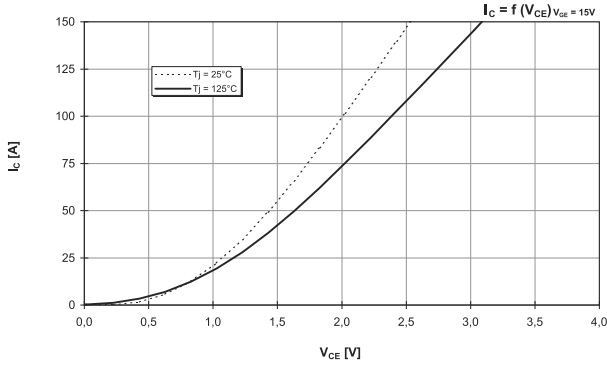


Fig.2 Transfer characteristic (Typical)

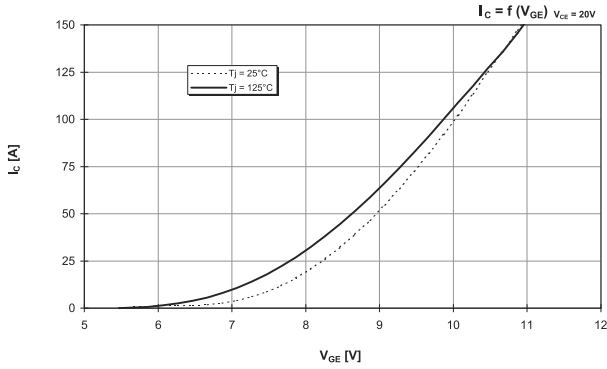


Fig.3 Reverse bias safe operation area (RBSOA)

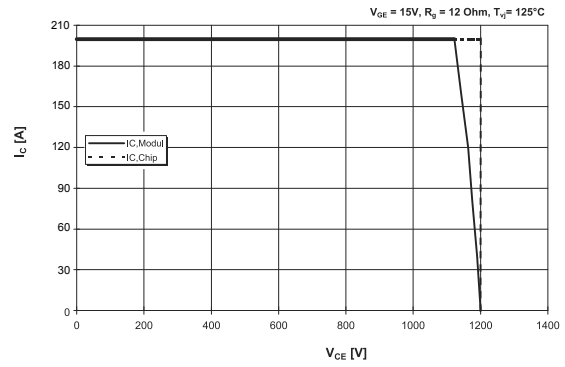


Fig.4 Switching losses (Typical)

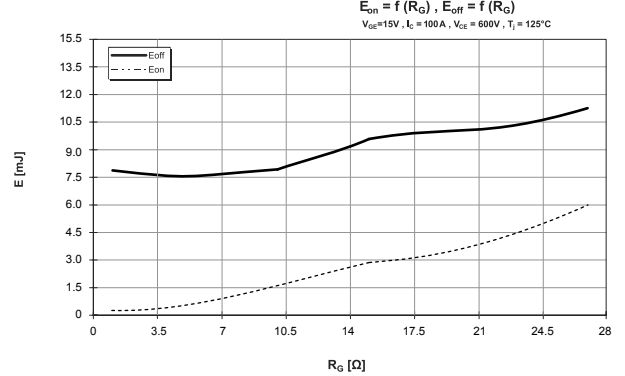
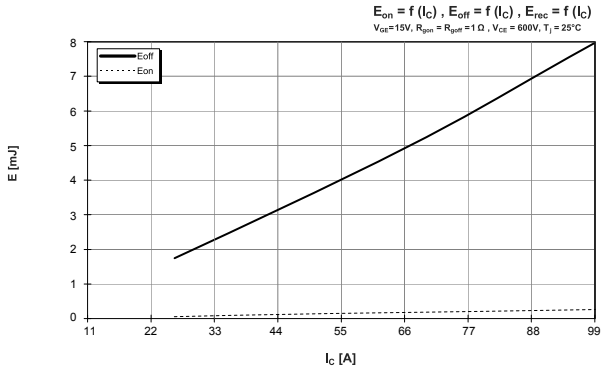
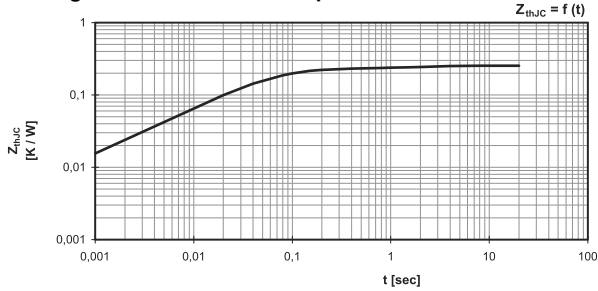


Fig.5 Transient thermal impedance





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