

SEMITRONICS CORP.

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SEG506200

POWER IGBT

FEATURES

- Isolated Case
- Hermetically Sealed Package
- High Current Capability
- Fast Switching
- Low $V_{CE(SAT)}$
- MOS Gate turn-on
- B.O. Substrate
- MIL STX Screening Available

APPLICATIONS

- High Reliability Power Supplies
- Switch Mode Power Supplies
- DC Choppers
- DC Servo & Robot Drives
- High Speed Power Switching

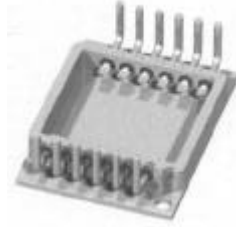
DESCRIPTION

The SEG506220 is a 200 Amp, 600 volts, Power IGBT packaged in an hermetically sealed metallic case.

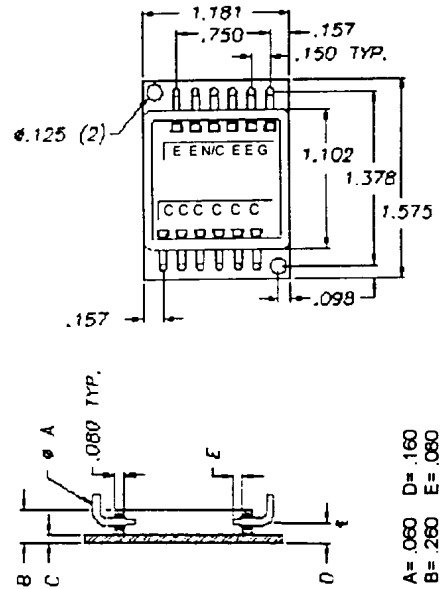
Provides High Power density in a military grade construction capable to withstand a force of 5000G's minimum.

Add STX suffix for Military screening

PACKAGE



CASE OUTLINE



Absolute Maximum Ratings

Parameter	Maximum	Units
Continuous Drain Current I_C @ $T_c = 25^\circ C$,	200	A
Continuous Drain Current I_C @ $T_c = 90^\circ C$	100	A
Pulse Collector Current I_{CM} @ $T_c = 25^\circ C$, 1ms	300	A
Power Dissipation P_C @ $T_c = 25^\circ C$	625	W
Gate-to-Emitter Voltage V_{GES}	± 20	V
Collector-to-Emitter Voltage V_{CES} @ $T_j = 25^\circ$ to $150^\circ C$	600	V
Operating & Storage Temperature T_j & T_{STG}	-55 to +150	$^\circ C$

Static @ T_j = 25°C (unless otherwise specified)

Parameter	Min.	Typ.	Max.	Units	Conditions
Collector-to-Emitter Breakdown V. $V_{(BR)CES}$	600	—	—	V	$V_{GE} = 0V, I_C = 250\mu A$
Collector-to-Emitter Saturation V. $V_{CE(sat)}$	—	—	2.5	V	$V_{GE} = 15V, I_C = 100A,$
Gate Threshold Voltage $V_{GE(th)}$	2.5	—	6	V	$V_{CE} = V_{GE}, I_C = 10\text{ mA}$
Zero Gate Voltage Collector Current I_{CES}	—	—	200	uA	$V_{CE} = 480V, V_{GE} = 0V$
	—	—	2000		$V_{CE} = 480V, V_{GE} = 0V, T_j = 125^\circ C$
Gate-to-Emitter Forward Leakage I_{GES}	—	—	400	nA	$V_{GE} = 20V, V_{CE} = 0V$
Gate-to-Emitter Forward Leakage I_{GES}	—	—	-400		$V_{GE} = -20V, V_{CE} = 0V$

Dynamic @ T_j = 25°C (unless otherwise specified)

Parameter	Min.	Typ.	Max.	Units	Conditions	
Forward Transconductance g_{fs}	40	57	—	S	$V_{CE} = 10V, I_C = 60A, \text{ pulse}$	
Total Gate Charge Q_g	—	465	—	nC	$I_C = 100A$ $V_{GE} = 15V$ $V_{CE} = 300V$	
Gate-to-Emitter Charge Q_{ge}	—	52	—			
Gate-to-Collectoe Charge Q_{gc}	—	228	—			
Turn-on-Delay Time $t_{d(on)}$	—	100	—	ns	Inductive Load @ T _j = 25° C $V_{GE} = 15V$ $V_{CE} = 480V$ $I_C = 100A$ $R_G = 2.4\text{ Ohms}$ $L = 30\text{ uH}$	
Rise Time t_r	—	100	—			
Turn-Off-Delay Time $t_{d(off)}$	—	800	1100			
Fall time t_f	—	350	500			
Turn-Off Switching Loss E_{off}	—	14.4	—	mJ		
Turn-On Switching Loss E_{on}	—	2.4	—			
Turn-on-Delay Time $t_{d(on)}$	—	100	—	ns		Inductive Load @ T _j = 125° C, $V_{GE} = 15V$ $V_{CE} = 480V$ $I_C = 100A$ $R_G = 2.4\text{ Ohms}$ $L = 30\text{ uH}$
Rise Time t_r	—	200	—			
Turn-Off-Delay Time $t_{d(off)}$	—	780	—			
Fall time t_f	—	250	—			
Turn-Off Switching Loss E_{off}	—	14.4	—	mJ		
Turn-On Switching Loss E_{on}	—	4.8	—			
Input Capacitance C_{ies}	—	9000	—	pF	$V_{CE} = 25V$	
Output Capacitance C_{oes}	—	600	—		$V_{GE} = 0V$	
Reverse Transfer Capacitance C_{res}	—	305	—		$f = 1.0\text{ MHZ}$	

Thermal Resistance

Parameter		Typ.	Max.	Units
Junction-to-case	$R_{\theta JC}$	—	0.19	°C/W
Case-to-Sink, flat, Greased Surface	$R_{\theta CS}$	0.045	—	

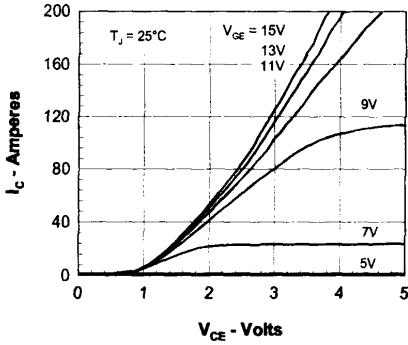


Fig. 1. Saturation Voltage Characteristics

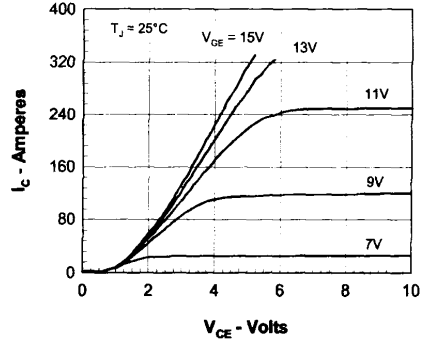


Fig. 2. Extended Output Characteristics

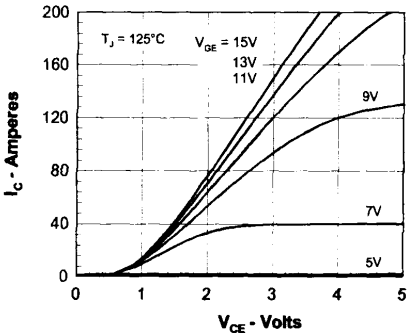


Fig. 3. Saturation Voltage Characteristics

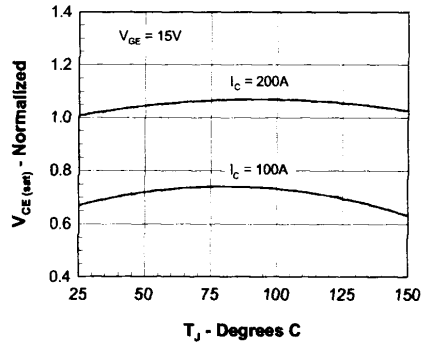


Fig. 4. Temperature Dependence of $V_{CE(sat)}$

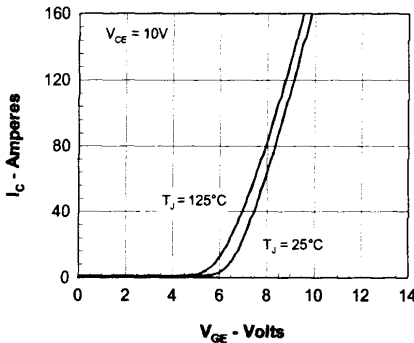


Fig. 5. Turn-off Safe Operating Area

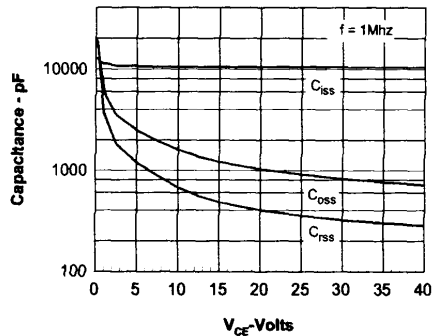


Fig. 6. Temperature Dependence of BV_{CES} & $V_{GE(th)}$