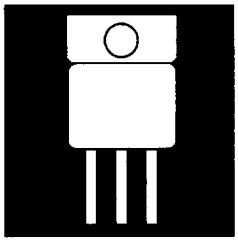
INSULATED GATE BIPOLAR TRANSISTOR (IGBT) IN A HERMETIC TO-258AA PACKAGE



500 Volt, 20 And 30 Amp, N-Channel IGBT With a Soft Recovery Diode In A Hermetic Metal Package

FEATURES

- Isolated Hermetic Metal Package
- High Input Impedance
- Low On-Voltage
- High Current Capability
- Fast Turn-Off
- Low Conductive Losses
- Free Wheeling Diode
- Available Screened To MIL-S-19500, TX, TXV And S Levels

DESCRIPTION

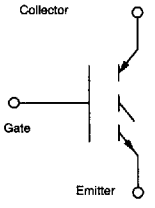
This power module includes an IGBT power transistor which features a high impedance insulated gate and the low on-resistance characteristics of bipolar transistor with a free wheeling diode connected across the emitter and collector. These devices are ideally suited for motor drives, UPS converters, power supplies and resonant power converters.

MAXIMUM RATINGS @ 25°C Unless Specified Otherwise

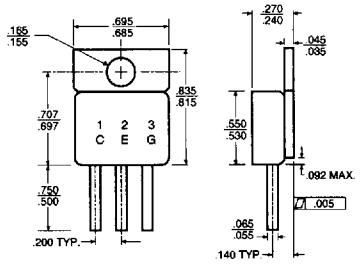
PART NUMBER	I_C (Cont.) @ 90°C, A	$V_{(BR)CES}$ V	$V_{CE(sat)}$ (Typ.) V	T_f (Typ.) ns	θ_{JC} °C/W	P_D W	T_J °C
OM6510SC	20	500	2.8	400	1.75	72	150
OM6511SC	30	500	2.8	400	1.00	125	150

3.1

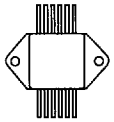
SCHEMATIC



MECHANICAL OUTLINE

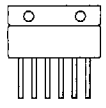


PACKAGE OPTIONS



MOD PAK

Note: IGBTs are also available in Z-Tab, dual and quad pak styles. Please call the factory for more information.



6 PIN SIP

Omnirel
205 Crawford Street, Leominster, MA 01453 USA (508) 534-5776 FAX (508) 537-4246

PRELIMINARY DATA: OM6510SC

IGBT CHARACTERISTICS

Parameter - OFF (see Note 1)		Min.	Typ.	Max.	Units	Test Conditions
$V_{(BR)CES}$	Collector Emitter Breakdown Voltage	500			V	$V_{GE} = 0$ $I_C = 250\ \mu A$
I_{CES}	Zero Gate Voltage Drain Current			0.25	mA	V_{CE} = Max. Rat., $V_{GE} = 0$
				1.0	mA	V_{CE} = 0.8 Max. Rat., $V_{GE} = 0$ $T_C = 125°C$
I_{GES}	Gate Emitter Leakage Current			±100	nA	$V_{GE} = \pm 20$ V $V_{CE} = 0$ V
Parameter - ON						
$V_{GE(th)}$	Gate Threshold Voltage	2.0		4.0	V	$V_{CE} = V_{GE}$, $I_C = 250\ \mu A$
$V_{CE(sat)}$	Collector Emitter Saturation Voltage		3.0		V	$V_{GE} = 15$ V, $I_C = 20$ A $T_C = 25°C$
$V_{CE(sat)}$	Collector Emitter Saturation Voltage		2.8	3.0	V	$V_{GE} = 15$ V, $I_C = 20$ A $T_C = 100°C$
Dynamic						
g_{fs}	Forward Transductance	5.0			S	$V_{CE} = 20$ V, $I_C = 20$ A
C_{ies}	Input Capacitance		1700		pF	$V_{GE} = 0$
C_{oes}	Output Capacitance		215		pF	$V_{CE} = 25$ V
C_{res}	Reverse Transfer Capacitance		115		pF	f = 1 mHz
Switching-Resistive Load						
$T_{d(on)}$	Turn-On Time		60		nS	$V_{CC} = 400$ V, $I_C = 20$ A
t_r	Rise Time		240		nS	$V_{GE} = 15$ V, $R_g = 47\ \Omega$
Switching-Inductive Load						
$t_{r(Volt)}$	Off Voltage Rise Time		.55		µS	$V_{CEclamp} = 400$ V, $I_C = 20$ A
t_f	Fall Time		.60		µS	$V_{GE} = 15$ V, $R_g = 100\ \Omega$
t_{cross}	Cross-Over Time		1.2		µS	L = 0.1 mH, $T_j = 100°C$
E_{off}	Turn-Off Losses		3.0		mJ	

DIODE CHARACTERISTICS

V_f	Maximum Forward Voltage			1.35	V	$I_F = 30$ A, $T_C = 25°C$
				1.15	V	$I_F = 30$ A, $T_C = 150°C$
I_r	Maximum Reverse Current			500	µA	$V_R = 600$ V, $T_C = 25°C$
				7.0	mA	$V_R = 480$ V, $T_C = 125°C$
t_{rr}	Reverse Recovery Time			35	nS	$I_F = 1$ A, $d_i/d_t = -15$ A µ/S $V_R = 30$ V, $T_j = 25°C$

Note 1: Limited by diode I_r characteristic.

PRELIMINARY DATA: OM6511SC

IGBT CHARACTERISTICS

Parameter - OFF (see Note 1)		Min.	Typ.	Max.	Units	Test Conditions
$V_{(BR)CES}$	Collector Emitter Breakdown Voltage	500			V	$V_{CE} = 0$ $I_C = 250\ \mu A$
I_{CES}	Zero Gate Voltage Drain Current			0.25	mA	V_{CE} = Max. Rat., $V_{GE} = 0$
				1.0	mA	V_{CE} = 0.8 Max. Rat., $V_{GE} = 0$ $T_C = 125°C$
I_{GES}	Gate Emitter Leakage Current			±100	nA	$V_{GE} = \pm 20$ V $V_{CE} = 0$ V
Parameter - ON						
$V_{GE(th)}$	Gate Threshold Voltage	2.0		4.0	V	$V_{CE} = V_{GE}$, $I_C = 250\ \mu A$
$V_{CE(sat)}$	Collector Emitter Saturation Voltage		3.0		V	$V_{GE} = 15$ V, $I_C = 30$ A $T_C = 25°C$
$V_{CE(sat)}$	Collector Emitter Saturation Voltage		2.8	3.0	V	$V_{GE} = 15$ V, $I_C = 30$ A $T_C = 125°C$
Dynamic						
g_{fs}	Forward Transductance	8.0			S	$V_{CE} = 15$ V, $I_C = 30$ A
C_{ies}	Input Capacitance			3500	pF	$V_{GE} = 0$
C_{oes}	Output Capacitance			250	pF	$V_{CE} = 25$ V
C_{res}	Reverse Transfer Capacitance			50	pF	f = 1 mHz
Switching-Resistive Load						
$T_{d(on)}$	Turn-On Time			100	nS	$V_{CC} = 400$ V, $I_C = 30$ A $V_{GE} = 15$ V, $R_g = 100\ \Omega$
t_r	Rise Time			200	nS	
$T_{d(off)}$	Turn-Off Delay Time			1.0	µS	
t_f	Fall Time			2.0	µS	
Switching-Inductive Load						
$T_{d(on)}$	Turn-On Delay Time			100	nS	$V_{CEclamp} = 400$ V, $I_C = 30$ A $V_{GE} = 15$ V, $R_g = 100\ \Omega$ L = 0.1 mH, $T_j = 100°C$
t_r	Rise Time			200	nS	
$T_{d(off)}$	Turn-Off Delay Time			1.0	nS	
t_f	Current Fall Time			3.0	µS	

DIODE CHARACTERISTICS

V_f	Maximum Forward Voltage			1.35	V	$I_F = 30$ A, $T_C = 25°C$
				1.15	V	$I_F = 30$ A, $T_C = 150°C$
I_r	Maximum Reverse Current			500	µA	$V_R = 600$ V, $T_C = 25°C$
				7.0	mA	$V_R = 480$ V, $T_C = 125°C$
t_{rr}	Reverse Recovery Time			35	nS	$I_F = 1$ A, $d_i/d_t = -15$ A µ/S $V_R = 30$ V, $T_j = 25°C$

Note 1: Limited by diode I_r characteristic.

3-1-150