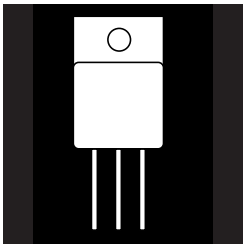
INSULATED GATE BIPOLAR TRANSISTOR (IGBT) IN A HERMETIC TO-254AA PACKAGE



500 Volt, 5 And 10 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
- Available Screened To MIL-S-19500, TX, TXV And S Levels
- Free Wheeling Diode
- Ceramic Feedthroughs Available

DESCRIPTION

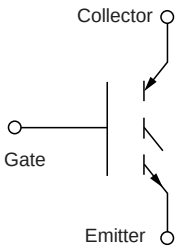
This power module includes an IGBT power transistor which features a high impedance insulated gate and the low on-resistance characteristics of bipolar transistor with a free wheeling diode connected across the emitter and collector. These devices are ideally suited for motor drives, UPS converters,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

MAXIMUM RATINGS @ 25°C Unless Specified Otherwise

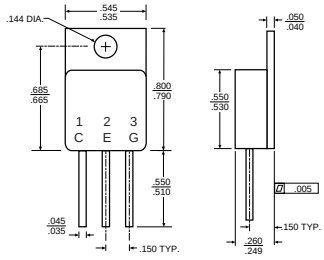
PART NUMBER	I_C (Cont.) @ 90°C, A	$V_{(BR)CES}$ V	$V_{CE\ (sat)}$ (Typ.) V	T_f (Typ.) ns	q_{JC} °C/W	P_D W	T_J °C
OM6508SA	5	500	2.8	400	3.8	35	150
OM6509SA	10	500	2.8	400	3.0	42	150

3.1

SCHEMATIC



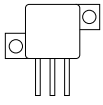
MECHANICAL OUTLINE



PIN CONNECTION
Pin 1: Collector
Pin 2: Emitter
Pin 3: Gate

PACKAGE OPTIONS

MOD PAK



Z-TAB

6 PIN SIP

Standard Products are supplied with glass feedthroughs. For ceramic feedthroughs, add the letter "C" to the part number. Example - OMXXXXCSA.
IGBTs are also available in Z-Tab, dual and quad pak styles - Please call the factory for more information.

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

PRELIMINARY DATA: OM6508SA

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 µA
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} = ±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 µA
$V_{CE(sat)}$	Collector Emitter Saturation Voltage		3.0		V	V_{GE} = 15 V, I_C = 5 A T_C = 25°C
$V_{CE(sat)}$	Collector Emitter Saturation Voltage		2.8	3.0	V	V_{GE} = 15 V, I_C = 5 A T_C = 100°C
Dynamic						
g_{fs}	Forward Transductance		2.0		S	V_{CE} = 20 V, I_C = 5 A
C_{ies}	Input Capacitance		260		pF	V_{GE} = 0
C_{oes}	Output Capacitance		50		pF	V_{CE} = 25 V
C_{res}	Reverse Transfer Capacitance		20		pF	f = 1 mHz
Switching-Resistive Load						
$T_{d(on)}$	Turn-On Time		37		nS	V_{CC} = 400 V, I_C = 5 A
t_r	Rise Time		150		nS	V_{GE} = 15 V, R_g = 47
Switching-Inductive Load						
$t_{r(Volt)}$	Off Voltage Rise Time		.35		µS	$V_{CEclamp}$ = 400 V, I_C = 5 A
t_f	Fall Time		.81		µS	V_{GE} = 15 V, R_g = 100
t_{cross}	Cross-Over Time		1.2		µS	L = 0.1 mH, T_j = 100°C
E_{off}	Turn-Off Losses		.95		mJ	

DIODE CHARACTERISTICS

V_f	Maximum Forward Voltage			1.5	V	I_F = 8 A, T_C = 25°C
				1.4	V	I_F = 8 A, T_C = 150°C
I_r	Maximum Reverse Current			150	µA	V_R = 600 V, T_C = 25°C
				1.5	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: OM6509SA

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 µA
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} = ±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 µA
$V_{CE(sat)}$	Collector Emitter Saturation Voltage		3.0	2.7	V	V_{GE} = 15 V, I_C = 10 A T_C = 25°C
$V_{CE(sat)}$	Collector Emitter Saturation Voltage		2.8	3.0	V	V_{GE} = 15 V, I_C = 10 A T_C = 100°C
Dynamic						
g_{fs}	Forward Transductance	2.5			S	V_{CE} = 20 V, I_C = 10 A
C_{ies}	Input Capacitance			950	pF	V_{GE} = 0
C_{oes}	Output Capacitance			140	pF	V_{CE} = 25 V
C_{res}	Reverse Transfer Capacitance			80	pF	f = 1 mHz
Switching-Resistive Load						
$T_{d(on)}$	Turn-On Time			150	nS	
T_r	Rise Time			1000	nS	V_{CC} = 400 V, I_C = 10 A
$T_{d(off)}$	Turn-Off Delay Time			700	nS	V_{GE} = 15 V, R_g = 100
T_f	Fall Time			1500	nS	
Switching-Inductive Load						
$T_{d(off)}$	Turn-Off Delay Time			1.2	µS	$V_{CEclamp}$ = 350 V, I_C = 10 A
t_f	Fall Time			1.5	µS	V_{GE} = 15 V, R_g = 100
t_{cross}	Cross-Over Time			2.0	µS	L = 180 µH, T_j = 100°C
E_{off}	Turn-Off Losses			4.0	mJ	

DIODE CHARACTERISTICS

V_f	Maximum Forward Voltage			1.4	V	I_F = 16 A, T_C = 25°C
				1.5	V	I_F = 16 A, T_C = 150°C
I_r	Maximum Reverse Current			500	µA	V_R = 600 V, T_C = 25°C
				3.0	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.