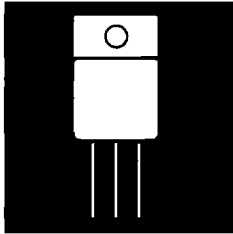


INSULATED GATE BIPOLAR TRANSISTOR (IGBT) IN A HERMETIC TO-254AA PACKAGE



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

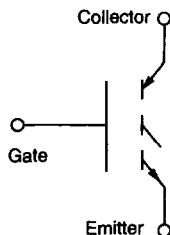
This power module includes an IGBT power transistor which features a high impedance insulated gate and the low on-resistance characteristics of bipolar transistor with a free wheeling diode connected across the emitter and collector. These devices are ideally suited for motor drives, UPS converters,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

MAXIMUM RATINGS @ 25°C Unless Specified Otherwise

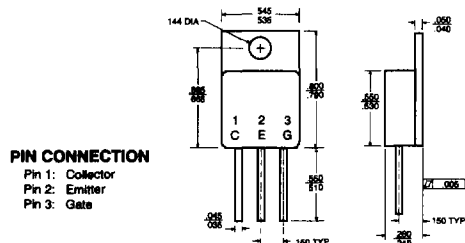
PART NUMBER	I_C (Cont.) @ 90°C, A	$V_{(BR)CES}$ V	$V_{CE(sat)}$ (Typ.) V	T_r (Typ.) ns	θ_{JC} °C/W	P_D W	T_J °C
OM6508SA	5	500	2.8	400	3.8	35	150
OM6509SA	10	500	2.8	400	3.0	42	150

3.1

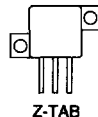
SCHEMATIC



MECHANICAL OUTLINE



PACKAGE OPTIONS



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.

PRELIMINARY DATA: OM6509SA

IGBT CHARACTERISTICS

Parameter - OFF (see Note 1)	Min.	Typ.	Max.	Units	Test Conditions
$V_{BE(ON)}$ Collector Emitter	500			V	$V_{CE} = 0$ $I_C = 250 \mu A$
Breakdown Voltage			0.25	mA	$V_{CE} = \text{Max. Rat.}, V_{GE} = 0$
I_{CES} Zero Gate Voltage			1.0	mA	$V_{CE} = 0.8 \text{ Max. Rat.}, V_{GE} = 0$ $T_C = 125^\circ C$
Drain Current			± 100	nA	$V_{GE} = \pm 20 V$ $V_{CE} = 0 V$
I_{GES} Gate Emitter Leakage					
Current					
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		3.0	2.7	V	$V_{GE} = 15 V, I_C = 10 A$ $T_C = 25^\circ C$
Saturation Voltage					
$V_{CE(sat)}$ Collector Emitter		2.8	3.0	V	$V_{GE} = 15 V, I_C = 10 A$ $T_C = 100^\circ C$
Saturation Voltage					
Dynamic					
g_{fs} Forward Transconductance	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	$f = 1 \text{ MHz}$
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	$V_{GE} = 15 V, R_\theta = 100 \Omega$
T_f Fall Time			1500	nS	
Switching-Inductive Load					
$T_{d(on)}$ Turn-On Delay Time			1.2	μS	$V_{CE(sat)} = 350 V, I_C = 10 A$
t_f Fall Time			1.5	μS	$V_{GE} = 15 V, R_\theta = 100 \Omega$
t_{cross} Cross-Over Time			2.0	μS	$L = 180 \mu H, T_C = 100^\circ C$
E_{off} Turn-Off Losses			4.0	mJ	
DIODE CHARACTERISTICS					
V_f Maximum Forward Voltage			1.4	V	$I_f = 16 A, T_C = 25^\circ C$
I_f Maximum Reverse Current			500	μA	$I_f = 16 A, T_C = 150^\circ C$
t_r Reverse Recovery Time			35	nS	$V_R = 600 V, T_C = 25^\circ C$ $V_R = 480 V, T_C = 125^\circ C$ $I_f = 1 A, dI/dt = -15 A/\mu S$ $V_R = 30 V, T_C = 25^\circ C$

Note 1: Limited by diode I_f characteristic.

PRELIMINARY DATA: OM6508SA

IGBT CHARACTERISTICS

Parameter - OFF (see Note 1)	Min.	Typ.	Max.	Units	Test Conditions
$V_{BE(ON)}$ Collector Emitter	500			V	$V_{CE} = 0$ $I_C = 250 \mu A$
Breakdown Voltage			0.25	mA	$V_{CE} = \text{Max. Rat.}, V_{GE} = 0$
I_{CES} Zero Gate Voltage			1.0	mA	$V_{CE} = 0.8 \text{ Max. Rat.}, V_{GE} = 0$ $T_C = 125^\circ C$
Drain Current			± 100	nA	$V_{GE} = \pm 20 V$ $V_{CE} = 0 V$
I_{GES} Gate Emitter Leakage					
Current					
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		3.0		V	$V_{GE} = 15 V, I_C = 5 A$ $T_C = 25^\circ C$
Saturation Voltage					
$V_{CE(sat)}$ Collector Emitter		2.8	3.0	V	$V_{GE} = 15 V, I_C = 5 A$ $T_C = 100^\circ C$
Saturation Voltage					
Dynamic					
g_{fs} Forward Transconductance	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	$f = 1 \text{ MHz}$
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	$V_{GE} = 15 V, R_\theta = 47 \Omega$
Switching-Inductive Load					
$t_{v(ov)}$ Off Voltage Rise Time		.35		μS	$V_{CE(sat)} = 400 V, I_C = 5 A$
t_f Fall Time		.81		μS	$V_{GE} = 15 V, R_\theta = 100 \Omega$
t_{cross} Cross-Over Time		1.2		μS	$L = 0.1 \text{ mH}, T_C = 100^\circ C$
E_{off} Turn-Off Losses		.95		mJ	
DIODE CHARACTERISTICS					
V_f Maximum Forward Voltage			1.5	V	$I_f = 8 A, T_C = 25^\circ C$
I_f Maximum Reverse Current			150	μA	$I_f = 8 A, T_C = 150^\circ C$
t_r Reverse Recovery Time			35	nS	$V_R = 600 V, T_C = 25^\circ C$ $V_R = 480 V, T_C = 125^\circ C$ $I_f = 1 A, dI/dt = -15 A/\mu S$ $V_R = 30 V, T_C = 25^\circ C$

Note 1: Limited by diode I_f characteristic.