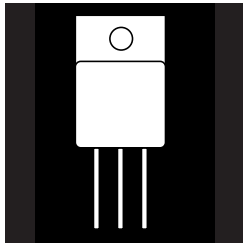


INSULATED GATE BIPOLAR TRANSISTOR (IGBT) IN A HERMETIC TO-254AA PACKAGE



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

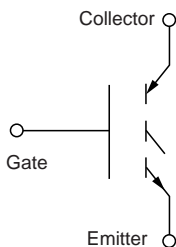
This power module includes an IGBT power transistor which features a high impedance insulated gate and the low on-resistance characteristics of bipolar transistor with a free wheeling diode connected across the emitter and collector. These devices are ideally suited for motor drives, UPS converters,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

MAXIMUM RATINGS @ 25°C Unless Specified Otherwise

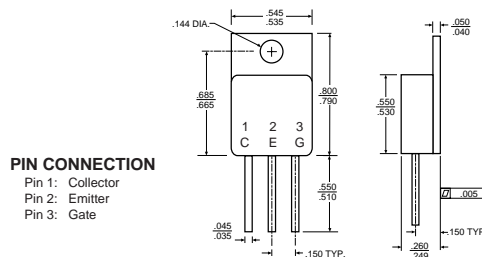
| PART NUMBER | I _C (Cont.) @ 90°C, A | V _{(BR)CES} V | V _{CE(sat)} (Typ.) V | T _f (Typ.) ns | α _{JC} °C/W | P _D W | T _J °C |
|-------------|----------------------------------|------------------------|-------------------------------|--------------------------|----------------------|------------------|-------------------|
| OM6508SA | 5 | 500 | 2.8 | 400 | 3.8 | 35 | 150 |
| OM6509SA | 10 | 500 | 2.8 | 400 | 3.0 | 42 | 150 |

3.1

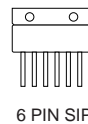
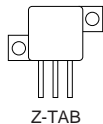
SCHEMATIC



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: 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 _r = -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 | V _{CC} = 400 V, I _C = 10 A |
| t _r Rise Time | | | 1000 | nS | |
| 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 _r = -15 A μ/S V _R = 30 V, T _J = 25°C |

Note 1: Limited by diode I_r characteristic.