

IGBT Module

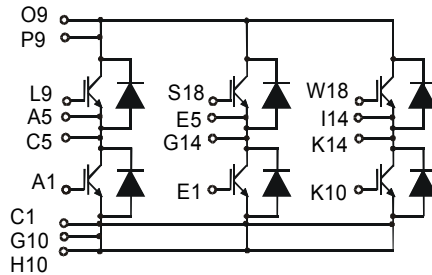
PSIIX 20/12

Preliminary Data Sheet

$$I_{C25} = 28 \text{ A}$$

$$V_{CES} = 1200 \text{ V}$$

$$V_{CE(sat)typ.} = 2.1 \text{ V}$$



PSIIX 20/12

IGBTs

| Symbol | Conditions | Maximum Ratings | |
|---------------------|--|-----------------|---------------|
| V_{CES} | $T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$ | 1200 | V |
| V_{GES} | | ± 20 | V |
| I_{C25} | $T_C = 25^{\circ}\text{C}$ | 28 | A |
| I_{C80} | $T_C = 80^{\circ}\text{C}$ | 17 | A |
| I_{CM} | $V_{GE} = \pm 15 \text{ V}; R_G = 56 \Omega; T_{VJ} = 125^{\circ}\text{C}$ | 45 | A |
| V_{CEK} | RBSOA, Clamped inductive load; $L = 100 \mu\text{H}$ | V_{CES} | |
| t_{SC} (SCSOA) | $V_{CE} = 900 \text{ V}; V_{GE} = \pm 15 \text{ V}; R_G = 56 \Omega; T_{VJ} = 125^{\circ}\text{C}$ non-repetitive | 10 | μs |
| P_{tot} | $T_C = 25^{\circ}\text{C}$ | 100 | W |

Features

- Easy paralleling due to the positive temperature coefficient of the on-state voltage
- Rugged XPT design (Xtreme light Punch Through) results in:
 - short circuit rated for 10 μsec .
 - very low gate charge
 - square RBSOA @ $3x I_C$
 - low EMI
- Thin wafer technology combined with the XPT design results in a competitive low $V_{CE(sat)}$
- Industry Standard Package
 - solderable pins for PCB mounting
 - isolated DCB ceramic base plate
- UL release applied

| Symbol | Conditions | Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified) | | |
|---------------|--|--|------|------|
| | | min. | typ. | max. |
| $V_{CE(sat)}$ | $I_C = 16 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$ | 1.8 | 2.1 | V |
| $V_{GE(th)}$ | $I_C = 0.4 \text{ mA}; V_{GE} = V_{CE}$ | 5.5 | 6.5 | V |
| I_{CES} | $V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$ | 0.01 | 0.1 | mA |
| I_{GES} | $V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$ | | 500 | nA |
| $t_{d(on)}$ | Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600 \text{ V}; I_C = 15 \text{ A}$ $V_{GE} = \pm 15 \text{ V}; R_G = 56 \Omega$ | | 70 | ns |
| t_r | | | 40 | ns |
| $t_{d(off)}$ | | | 250 | ns |
| t_f | | | 100 | ns |
| E_{on} | | | 1.55 | mJ |
| E_{off} | | 1.7 | mJ | |
| Q_{Gon} | $V_{CE} = 600 \text{ V}; V_{GE} = 15 \text{ V}; I_C = 15 \text{ A}$ | 47 | | nC |
| R_{thJC} | (per IGBT) | | 1.3 | K/W |
| R_{thJH} | (per IGBT) with heatsink compound | tdb | | K/W |

Applications

- AC drives
- power supplies with power factor correction

Advantages

- Easy to mount with two screws
- Space and weight savings
- Improved temperature and power cycling capability
- High power density
- Small and light weight

Caution: These devices are sensitive to electrostatic discharge. Users should observe proper ESD handling precautions.

Diodes

| Symbol | Conditions | Maximum Ratings | |
|-----------|--------------------------|-----------------|---|
| I_{F25} | $T_C = 25^\circ\text{C}$ | 33 | A |
| I_{F80} | $T_C = 80^\circ\text{C}$ | 22 | A |

| Symbol | Conditions | Characteristic Values | | |
|----------------------|---|-----------------------|------|---------|
| | | min. | typ. | max. |
| V_F | $I_F = 20\text{ A}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 150^\circ\text{C}$ | 1,8 | 2,2 | V |
| I_{RM} t_{tr} | $I_F = 20\text{ A}; di_F/dt = -750\text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}$ $V_R = 600\text{ V}; V_{GE} = 0\text{ V}$ | tbd | tbd | A ns |
| R_{thJC} | (per diode) | | | 1,5 K/W |
| R_{thJH} | (per diode) with heatsink compound | tbd | | K/W |

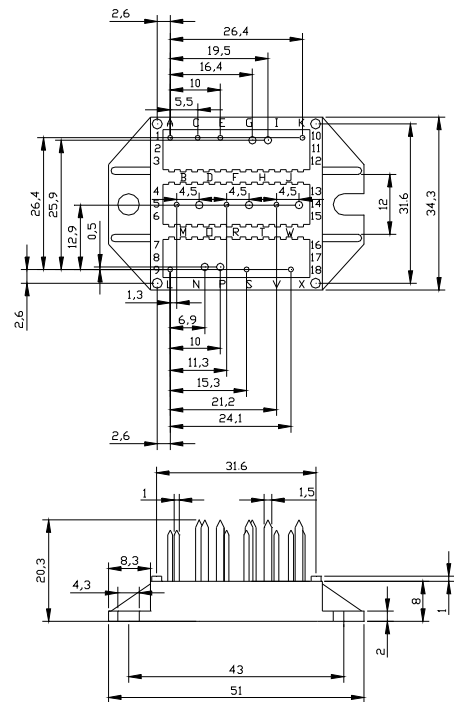
Component

| Symbol | Conditions | Maximum Ratings | |
|------------|--|-----------------|------------------|
| T_{VJ} | | -40...+150 | $^\circ\text{C}$ |
| T_{stg} | | -40...+125 | $^\circ\text{C}$ |
| V_{ISOL} | $I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}; t = 1\text{ s}$ | 3600 | V~ |
| M_d | Mounting torque (M4) | 1.5 - 2.0 | Nm |
| | | 14 - 18 | lb.in. |
| a | Max. allowable acceleration | 50 | m/s^2 |

| Symbol | Conditions | Characteristic Values | | |
|--------|--|-----------------------|------|------|
| | | min. | typ. | max. |
| d_s | Creepage distance on surface (Pin to heatsink) | 11.2 | | mm |
| d_A | Strike distance in air (Pin to heatsink) | 11.2 | | mm |
| Weight | | | 24 | g |

Package style and outline

Dimensions in mm (1mm = 0.0394")



Tolerances: +/- 0,3 mm

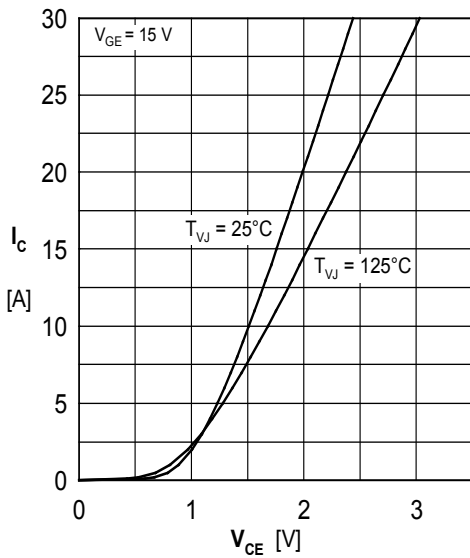


Fig. 1 Typ. output characteristics

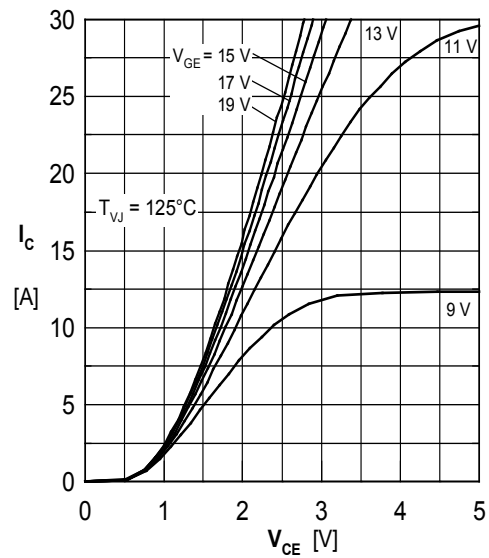


Fig. 2 Typ. output characteristics

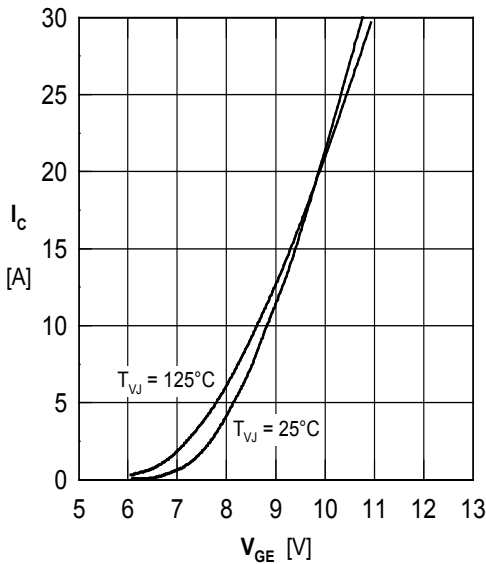


Fig. 3 Typ. transfer characteristics

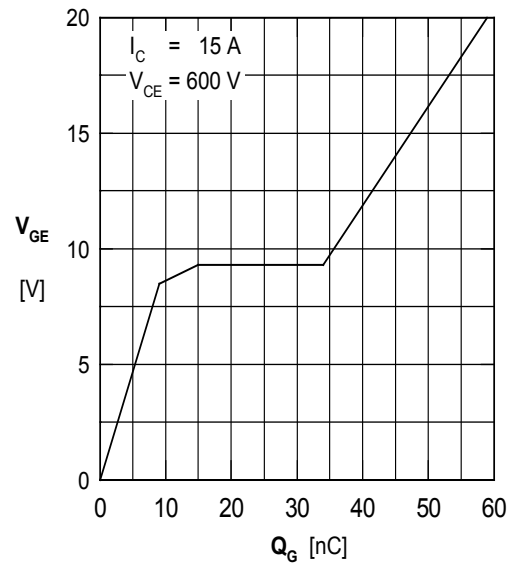


Fig. 4 Typ. turn-on gate charge

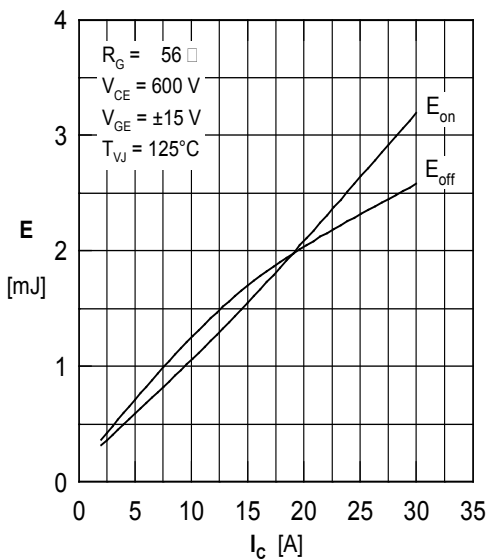


Fig. 5 Typ. switching energy vs. collector current

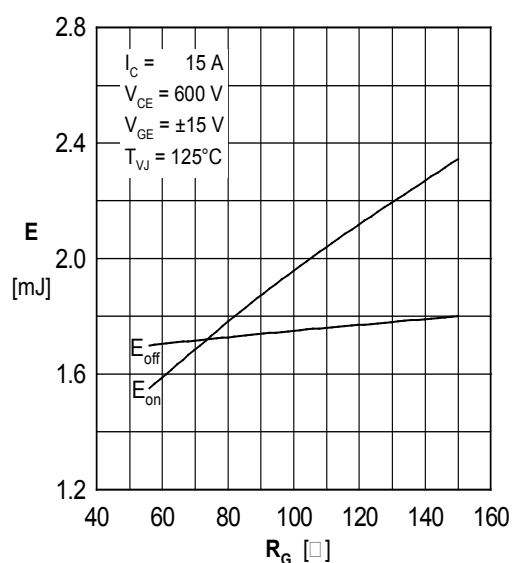


Fig. 6 Typ. switching energy vs. gate resistance