

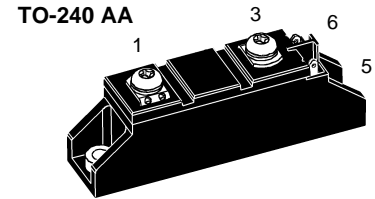
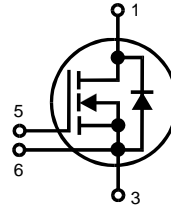
HiPerFET™ Power Module

VMO 60-05F

$V_{DSS} = 500\text{ V}$
 $I_{D25} = 60\text{ A}$
 $R_{DS(on)} = 65\text{ m}\Omega$

High dv/dt, Low t_{rr} , HDMOS™ Family

Preliminary Data



1 = Drain 3 = Source
 5 = Gate 6 = Kelvin Source

| Symbol | Conditions | Maximum Ratings | |
|---------------|--|--------------------------------|------------------------|
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | 500 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 10\text{ k}\Omega$ | 500 | V |
| V_{GS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 60 | A |
| I_{D100} | $T_C = 100^\circ\text{C}$ | 37 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$, $t_p = 10\text{ }\mu\text{s}$, pulse width limited by T_{JM} | 240 | A |
| P_{tot} | $T_C = 25^\circ\text{C}$ | 590 | W |
| T_J | | -40 ... +150 | $^\circ\text{C}$ |
| T_{JM} | | 150 | $^\circ\text{C}$ |
| T_{stg} | | -40 ... +125 | $^\circ\text{C}$ |
| V_{ISOL} | 50/60 Hz, $t = 1\text{ min}$ $I_{ISOL} \leq 1\text{ mA}$, $t = 1\text{ s}$ | 3000 3600 | V~ V~ |
| M_d | Mounting torque (M5 or 10-32 UNF) Terminal connection torque (M5) | 2.5-4.0/22-35 2.5-4.0/22-35 | Nm/lb.in. Nm/lb.in. |
| Weight | Typical including screws | 90 | g |

Features

- International standard package
- Direct copper bonded Al_2O_3 ceramic base plate
- Isolation voltage 3600 V~
- Low $R_{DS(on)}$ HDMOS™ process

Applications

- Switched-mode and resonant-mode power supplies
- Uninterruptible power supplies (UPS)
- DC servo and robot drives
- DC choppers

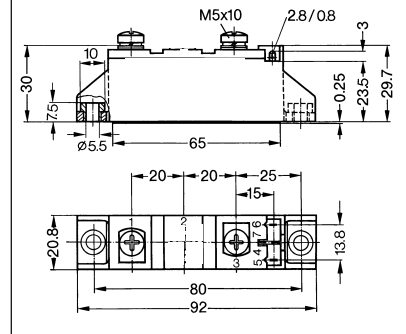
Advantages

- Easy to mount with two screws
- Space and weight savings
- High power density
- Low losses

| Symbol | Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|---|---|------|---------------------------|
| | | min. | typ. | max. |
| V_{DSS} | $V_{GS} = 0\text{ V}$ | 500 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 24\text{ mA}$ | 2 | | V |
| I_{GSS} | $V_{GS} = \pm 20\text{ V DC}$, $V_{DS} = 0$ | | | 500 nA |
| I_{DSS} | $V_{DS} = V_{DSS}$, $V_{GS} = 0\text{ V}$, $T_J = 25^\circ\text{C}$ $V_{DS} = 0.8 \cdot V_{DSS}$, $V_{GS} = 0\text{ V}$, $T_J = 125^\circ\text{C}$ | | | 600 μA 3 mA |
| $R_{DS(on)}$ | $V_{GS} = 10\text{ V}$, $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $d \leq 2\%$ | | 65 | 75 m Ω |

Data per MOSFET unless otherwise stated.

| Symbol | Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | | |
|---|---|---|------|---------------------|----|
| | | min. | typ. | max. | |
| g_{fs} | $V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ pulsed | 30 | 60 | S | |
| C_{iss} C_{oss} C_{rss} | } $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 12.6 | nF | |
| | | | | 1.35 | nF |
| | | | | 0.405 | nF |
| $t_{d(on)}$ t_r $t_{d(off)}$ t_f | } $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (External), resistive load | | 50 | ns | |
| | | | | 45 | ns |
| | | | | 250 | ns |
| | | | | 30 | ns |
| Q_g Q_{gs} Q_{gd} | } $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ | | 405 | nC | |
| | | | | 90 | nC |
| | | | | 180 | nC |
| R_{thJC} R_{thCH} | heatsink compound applied | | 0.2 | K/W K/W | |
| d_s | Creepage distance on surface | 12.7 | | mm | |
| d_A | Strike distance through air | 9.6 | | mm | |
| a | Allowable acceleration | | | 50 m/s ² | |

Dimensions in mm (1 mm = 0.0394")


| Symbol | Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|----------|---|---|------|--------|
| | | min. | typ. | max. |
| I_S | $V_{GS} = 0\text{ V}$ | | | 60 A |
| I_{SM} | Repetitive; pulse width limited by T_{JM} | | | 240 A |
| V_{SD} | $I_F = I_S; V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | | | 1.5 V |
| t_{rr} | $I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$ | | | 250 ns |