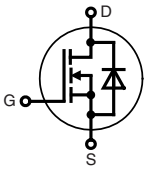
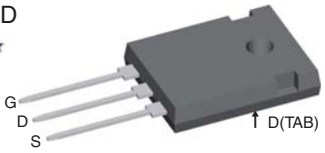
# COOLMOS® * Power MOSFET

$I_{D25}$ = 35 A
$V_{DSS}$ = 600 V
$R_{DS(on)\ max}$ = 0.1 Ω

N-Channel Enhancement Mode
Low $R_{DSon}$, High $V_{DSS}$ MOSFET
Ultra low gate charge




TO-247 AD




| MOSFET | | | | |
|---|---|---|---|---|
| **Symbol** | **Conditions** | | **Maximum Ratings** | |
| $V_{DSS}$ | $T_{VJ}$ = 25°C | | 600 | V |
| $V_{GS}$ | | | ± 20 | V |
| $I_{D25}$ | $T_C$ = 25°C | | 35 | A |
| $I_{D90}$ | $T_C$ = 90°C | | 25 | A |
| $E_{AS}$ | single pulse | $I_D$ = 11 A; $T_C$ = 25°C | 800 | mJ |
| $E_{AR}$ | repetitive | | 1.2 | mJ |
| dV/dt | MOSFET dV/dt ruggedness $V_{DS}$ = 0...480 V | | 50 | V/ns |

| **Symbol** | **Conditions** | | **Characteristic Values** ($T_{VJ}$ = 25°C, unless otherwise specified) | | | |
|---|---|---|---|---|---|---|
| | | | **min.** | **typ.** | **max.** | |
| $R_{DSon}$ | $V_{GS}$ = 10 V; $I_D$ = 18 A | | | 90 | 100 | mΩ |
| $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$; $I_D$ = 1.2 mA | | 2.5 | 3 | 3.5 | V |
| $I_{DSS}$ | $V_{DS}$ = 600 V; $V_{GS}$ = 0 V | $T_{VJ}$ = 25°C | | | 5 | µA |
| | | $T_{VJ}$ = 125°C | | 50 | | µA |
| $I_{GSS}$ | $V_{GS}$ = ± 20 V; $V_{DS}$ = 0 V | | | | 100 | nA |
| $C_{iss}$ | $V_{GS}$ = 0 V; $V_{DS}$ = 100 V | | | 2800 | | pF |
| $C_{oss}$ | f = 1 MHz | | | 130 | | pF |
| $Q_g$ | $V_{GS}$ = 0 to 10 V; $V_{DS}$ = 400 V; $I_D$ = 18 A | | | 60 | 80 | nC |
| $Q_{gs}$ | | | | 14 | | nC |
| $Q_{gd}$ | | | | 20 | | nC |
| $t_{d(on)}$ | $V_{GS}$ = 10 V; $V_{DS}$ = 400 V | | | 10 | | ns |
| $t_r$ | $I_D$ = 18 A; $R_G$ = 3.3 Ω | | | 5 | | ns |
| $t_{d(off)}$ | | | | 60 | | ns |
| $t_f$ | | | | 5 | | ns |
| $R_{thJC}$ | | | | | 0.35 | K/W |

### Features

- fast COOLMOS® * power MOSFET 4th generation
  - High blocking capability
  - Lowest resistance
  - Avalanche rated for unclamped inductive switching (UIS)
  - Low thermal resistance due to reduced chip thickness
- Enhanced total power density

### Applications

- Switched mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)
- Power factor correction (PFC)
- Welding
- Inductive heating
- PDP and LCD adapter

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IXYS reserves the right to change limits, test conditions and dimensions.

20090209c

## Source-Drain Diode

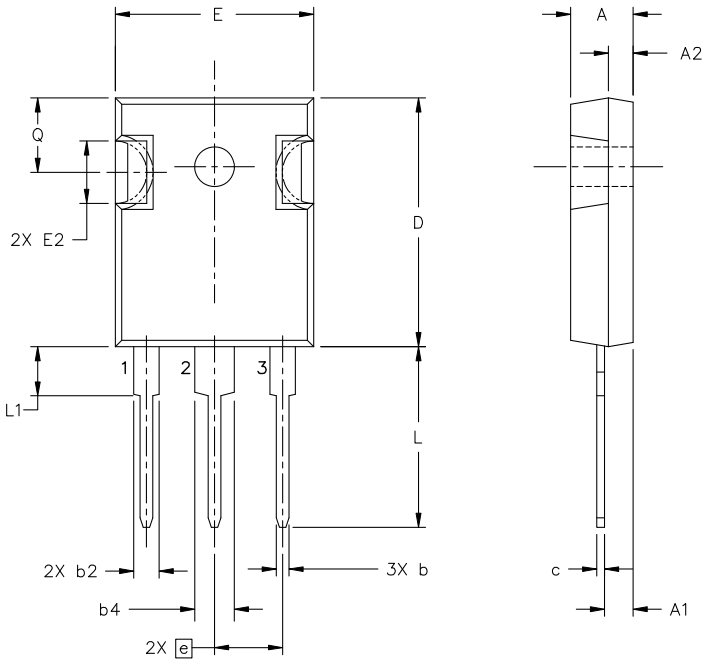
| Symbol | Conditions | Characteristic Values ($T_{VJ}$ = 25°C, unless otherwise specified) min. | typ. | max. | |
|---|---|---|---|---|---|
| $I_S$ | $V_{GS}$ = 0 V | | | 18 | A |
| $V_{SD}$ | $I_F$ = 18 A; $V_{GS}$ = 0 V | | 0.9 | 1.2 | V |
| $t_{rr}$ | $I_F$ = 18 A; -$di_F$/dt = 100 A/µs; $V_R$ = 400 V | | 450 | | ns |
| $Q_{RM}$ | | | 12 | | µC |
| $I_{RM}$ | | | 70 | | A |

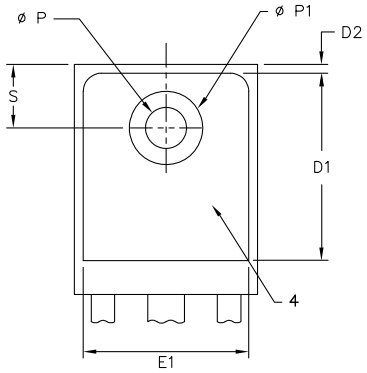
## Component

| Symbol | Conditions | Maximum Ratings | |
|---|---|---|---|
| $T_{VJ}$ | operating | -55...+150 | °C |
| $T_{stg}$ | | -55...+150 | °C |
| $M_d$ | mounting torque | 0.8 ... 1.2 | Nm |

| Symbol | Conditions | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $R_{thCH}$ | with heatsink compound | | 0.25 | | K/W |
| **Weight** | | | 6 | | g |

**TO-247 AD Outline**




| Symbol | Inches | | Millimeters | |
|---|---|---|---|---|
| | min | max | min | max |
| A | 0.185 | 0.209 | 4.70 | 5.30 |
| A1 | 0.087 | 0.102 | 2.21 | 2.59 |
| A2 | 0.059 | 0.098 | 1.50 | 2.49 |
| D | 0.819 | 0.845 | 20.79 | 21.45 |
| E | 0.610 | 0.640 | 15.48 | 16.24 |
| E2 | 0.170 | 0.216 | 4.31 | 5.48 |
| e | 0.215 BSC | | 5.46 BSC | |
| L | 0.780 | 0.800 | 19.80 | 20.30 |
| L1 | - | 0.177 | - | 4.49 |
| ØP | 0.140 | 0.144 | 3.55 | 3.65 |
| Q | 0.212 | 0.244 | 5.38 | 6.19 |
| S | 0.242 BSC | | 6.14 BSC | |
| b | 0.039 | 0.055 | 0.99 | 1.40 |
| b2 | 0.065 | 0.094 | 1.65 | 2.39 |
| b4 | 0.102 | 0.135 | 2.59 | 3.43 |
| c | 0.015 | 0.035 | 0.38 | 0.89 |
| D1 | 0.515 | - | 13.07 | - |
| D2 | 0.020 | 0.053 | 0.51 | 1.35 |
| E1 | 0.530 | - | 13.45 | - |
| ØP1 | - | 0.291 | - | 7.39 |

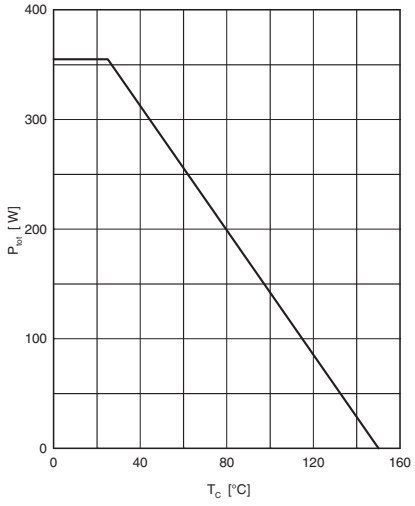



Fig. 1 Power dissipation

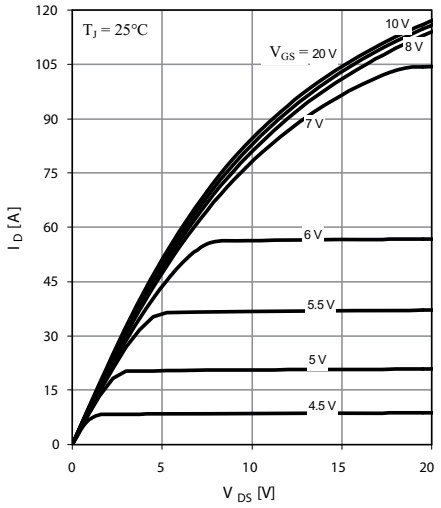



Fig. 2 Typ. output characteristics

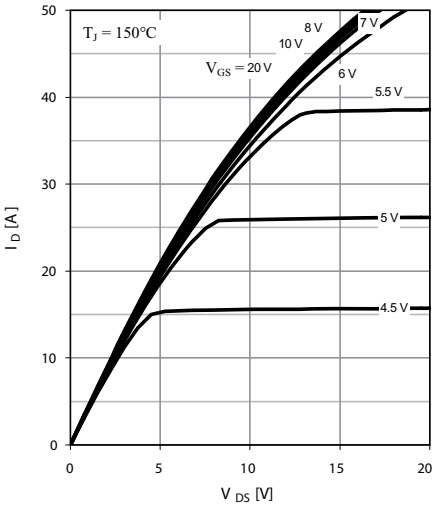



Fig. 3 Typ. output characteristics

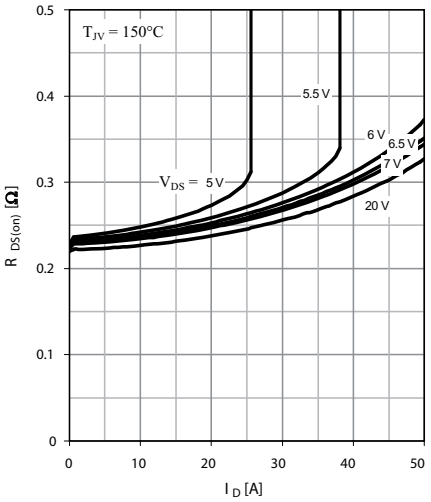



Fig. 4 Typ. drain-source on-state resistance characteristics of IGBT

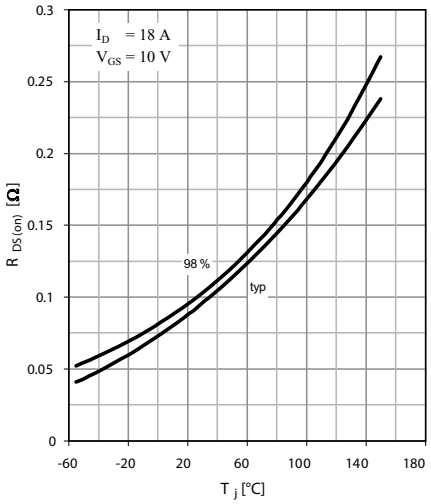



Fig. 5 Drain-source on-state resistance

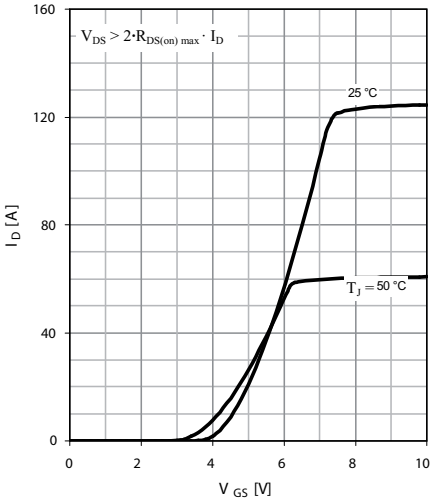



Fig. 6 Typ. transfer characteristics

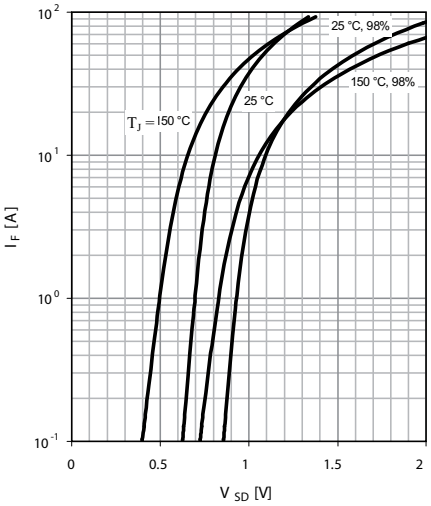



Fig. 7 Forward characteristic of reverse diode

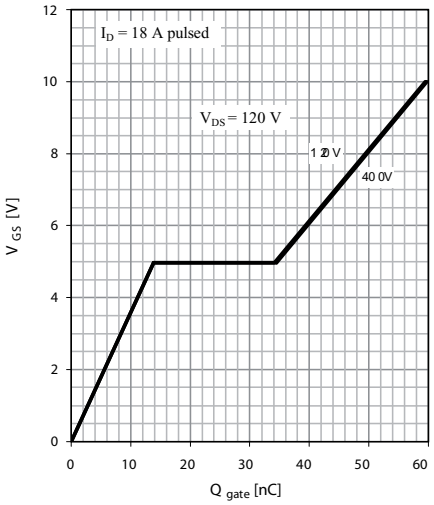



Fig. 8 Typ. gate charge

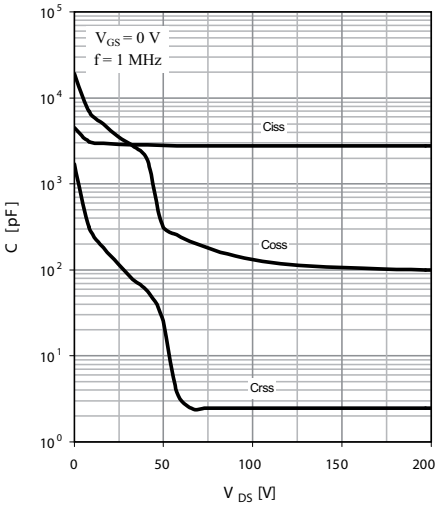



Fig. 9 Typ. capacitances

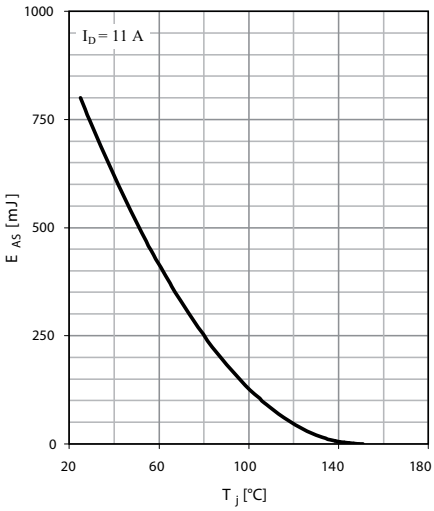



Fig. 10 Avalanche energy

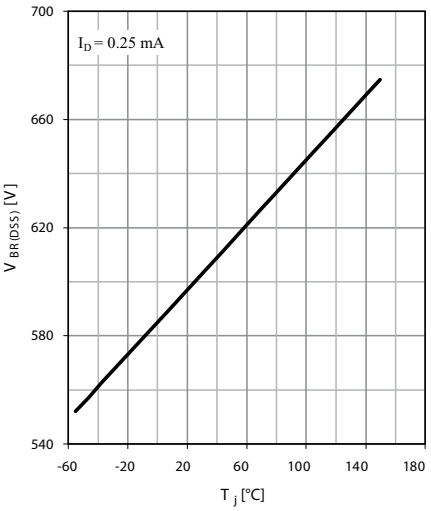



Fig. 11 Drain-source breakdown voltage

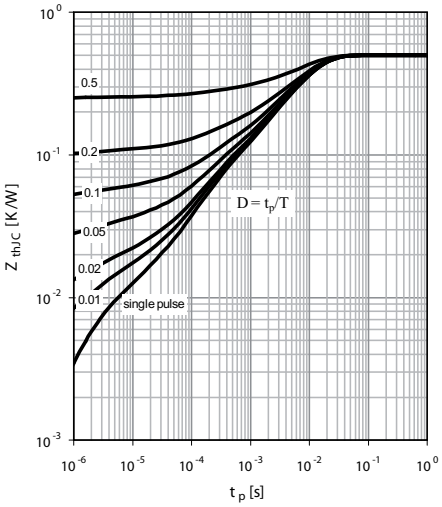



Fig. 12 Max. transient thermal impedance