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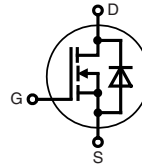
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



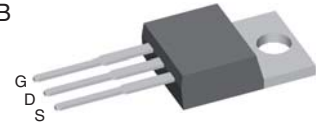
# CoolMOS™ 1, Power MOSFET

N-Channel Enhancement Mode  
Low  $R_{DS(on)}$ , High  $V_{DSS}$  MOSFET  
Ultra low gate charge

$$\begin{aligned} I_{D25} &= 10 \text{ A} \\ V_{DSS} &= 600 \text{ V} \\ R_{DS(on) \text{ max}} &= 0.385 \Omega \end{aligned}$$



TO-220 AB



| MOSFET    |                                                                |                 |      |
|-----------|----------------------------------------------------------------|-----------------|------|
| Symbol    | Conditions                                                     | Maximum Ratings |      |
| $V_{DSS}$ | $T_{VJ} = 25^{\circ}\text{C}$                                  | 600             | V    |
| $V_{GS}$  |                                                                | $\pm 20$        | V    |
| $I_{D25}$ | $T_C = 25^{\circ}\text{C}$                                     | 10              | A    |
| $I_{D90}$ | $T_C = 90^{\circ}\text{C}$                                     | 7               | A    |
| $E_{AS}$  | single pulse } $I_D = 3.4 \text{ A}; T_C = 25^{\circ}\text{C}$ | 225             | mJ   |
| $E_{AR}$  |                                                                | 0.3             | mJ   |
| $dV/dt$   | MOSFET $dV/dt$ ruggedness $V_{DS} = 0 \dots 480 \text{ V}$     | 50              | V/ns |

## Features

- fast CoolMOS™ 1) power MOSFET 4<sup>th</sup> 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

1) CoolMOS™ is a trademark of Infineon Technologies AG.

| Symbol       | Conditions                                                                         | Characteristic Values                                |      |      |     |
|--------------|------------------------------------------------------------------------------------|------------------------------------------------------|------|------|-----|
|              |                                                                                    | (T <sub>VJ</sub> = 25°C, unless otherwise specified) |      |      |     |
|              |                                                                                    | min.                                                 | typ. | max. |     |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}; I_D = 5.2 \text{ A}$                                       |                                                      | 350  | 385  | mΩ  |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}; I_D = 0.34 \text{ mA}$                                           | 2.5                                                  | 3    | 3.5  | V   |
| $I_{DSS}$    | $V_{DS} = 600 \text{ V}; V_{GS} = 0 \text{ V}$                                     |                                                      |      | 1    | μA  |
|              | $T_{VJ} = 25^{\circ}\text{C}$                                                      |                                                      |      |      |     |
|              | $T_{VJ} = 125^{\circ}\text{C}$                                                     |                                                      | 10   |      | μA  |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$                                  |                                                      |      | 100  | nA  |
| $C_{iss}$    | $V_{GS} = 0 \text{ V}; V_{DS} = 100 \text{ V}$                                     |                                                      | 790  |      | pF  |
| $C_{oss}$    |                                                                                    |                                                      | 38   |      | pF  |
| $Q_g$        | $V_{GS} = 0 \text{ to } 10 \text{ V}; V_{DS} = 400 \text{ V}; I_D = 5.2 \text{ A}$ |                                                      | 17   | 22   | ns  |
| $Q_{gs}$     |                                                                                    |                                                      | 4    |      | ns  |
| $Q_{gd}$     |                                                                                    |                                                      | 6    |      | ns  |
| $t_{d(on)}$  | $V_{GS} = 10 \text{ V}; V_{DS} = 400 \text{ V}$                                    |                                                      | 10   |      | ns  |
| $t_r$        |                                                                                    |                                                      | 5    |      | ns  |
| $t_{d(off)}$ |                                                                                    |                                                      | 40   |      | ns  |
| $t_f$        |                                                                                    |                                                      | 5    |      | ns  |
| $R_{thJC}$   |                                                                                    |                                                      |      | 1.15 | K/W |

**Source-Drain Diode**

| Symbol   | Conditions                                                                    | Characteristic Values |      |               |
|----------|-------------------------------------------------------------------------------|-----------------------|------|---------------|
|          |                                                                               | min.                  | typ. | max.          |
| $I_S$    | $V_{GS} = 0\text{ V}$                                                         |                       |      | 5.2           |
| $V_{SD}$ | $I_F = 5.2\text{ A}; V_{GS} = 0\text{ V}$                                     | 0.9                   | 1.2  |               |
| $t_{rr}$ | $I_F = 5.2\text{ A}; -di_F/dt = 100\text{ A}/\mu\text{s}; V_R = 400\text{ V}$ | 260                   |      | ns            |
| $Q_{RM}$ |                                                                               | 3.1                   |      | $\mu\text{C}$ |
| $I_{RM}$ |                                                                               | 24                    |      | A             |

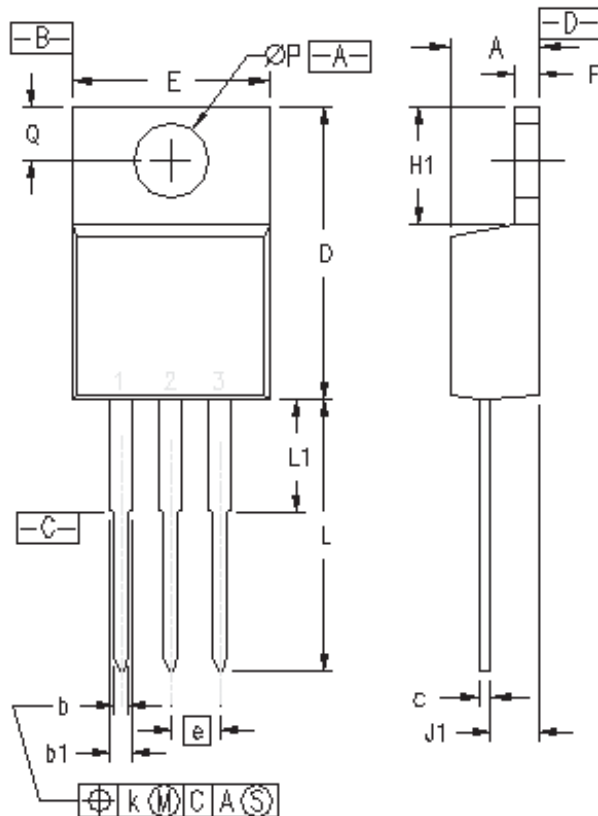
**Component**

| Symbol    | Conditions      | Maximum Ratings |                    |
|-----------|-----------------|-----------------|--------------------|
| $T_{VJ}$  | operating       | -55...+150      | $^{\circ}\text{C}$ |
| $T_{stg}$ |                 | -55...+150      | $^{\circ}\text{C}$ |
| $M_d$     | mounting torque | 0.4 ... 0.6     | Nm                 |

| Symbol     | Conditions             | Characteristic Values |      |      |
|------------|------------------------|-----------------------|------|------|
|            |                        | min.                  | typ. | max. |
| $R_{thCH}$ | with heatsink compound | 0.50                  |      | K/W  |
| Weight     |                        | 2                     |      | g    |

## TO-220 AB Outline



| SYM | INCHES   |      | MILLIMETERS |       |
|-----|----------|------|-------------|-------|
|     | MIN      | MAX  | MIN         | MAX   |
| A   | .170     | .190 | 4.32        | 4.83  |
| b   | .025     | .040 | 0.64        | 1.02  |
| b1  | .045     | .065 | 1.15        | 1.65  |
| c   | .014     | .022 | 0.35        | 0.56  |
| D   | .580     | .630 | 14.73       | 16.00 |
| E   | .390     | .420 | 9.91        | 10.66 |
| e   | .100 BSC |      | 2.54 BSC    |       |
| F   | .045     | .055 | 1.14        | 1.40  |
| H1  | .230     | .270 | 5.85        | 6.85  |
| J1  | .090     | .110 | 2.29        | 2.79  |
| k   | 0        | .015 | 0           | 0.38  |
| L   | .500     | .550 | 12.70       | 13.97 |
| L1  | .110     | .230 | 2.79        | 5.84  |
| ØP  | .139     | .161 | 3.53        | 4.08  |
| Q   | .100     | .125 | 2.54        | 3.18  |

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-220 AB.

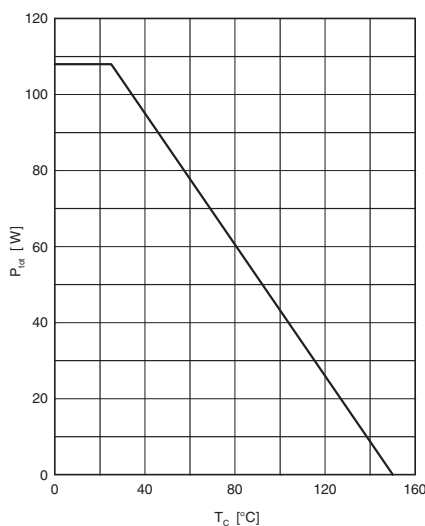


Fig. 1 Power dissipation

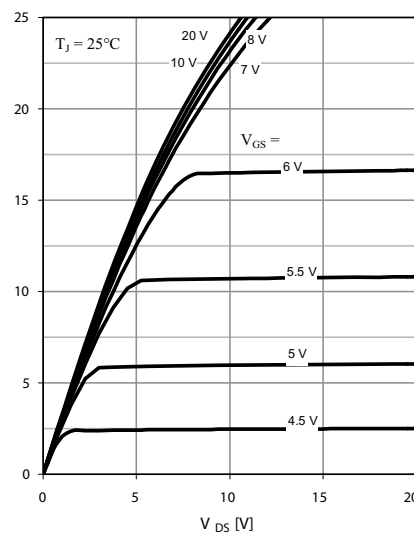


Fig. 2 Typ. output characteristics

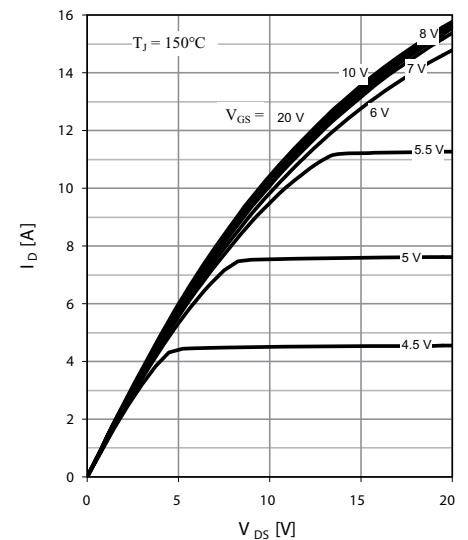


Fig. 3 Typ. output characteristics

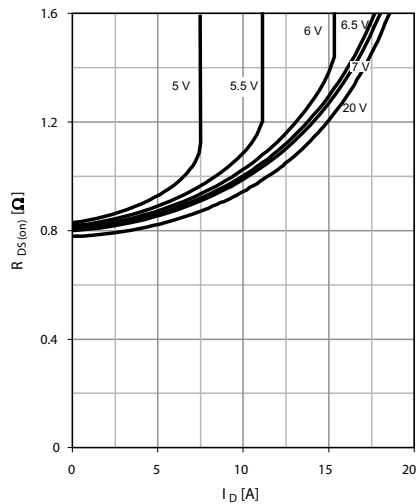


Fig. 4 Typ. drain-source on-state resistance characteristics of IGBT

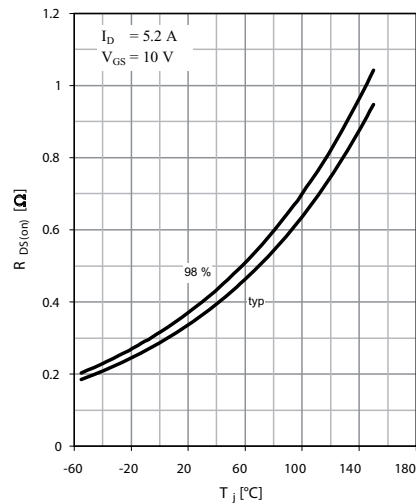


Fig. 5 Drain-source on-state resistance

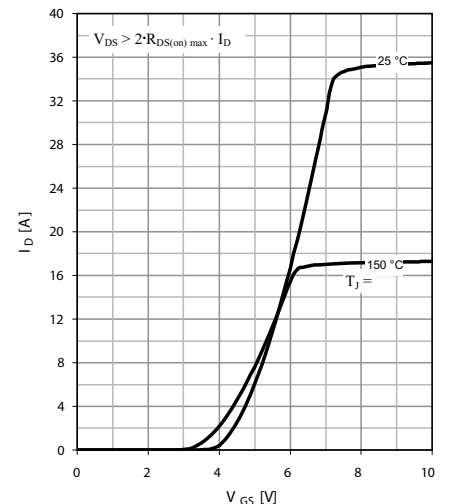


Fig. 6 Typ. transfer characteristics

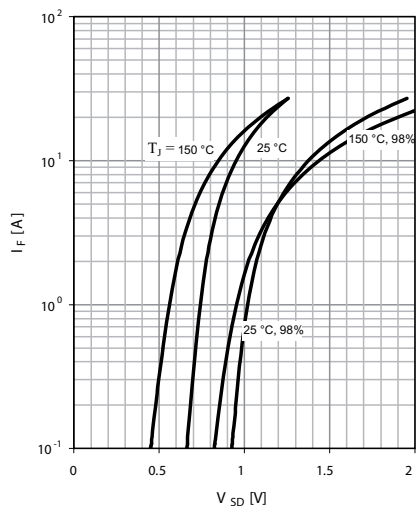


Fig. 7 Forward characteristic of reverse diode

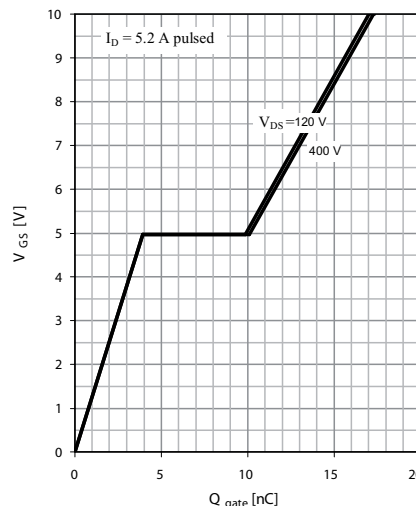


Fig. 8 Typ. gate charge

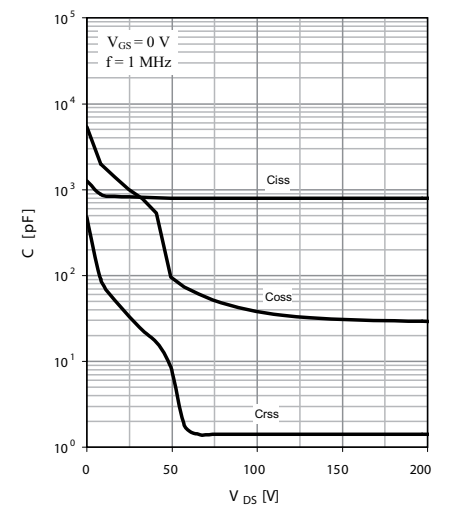


Fig. 9 Typ. capacitances

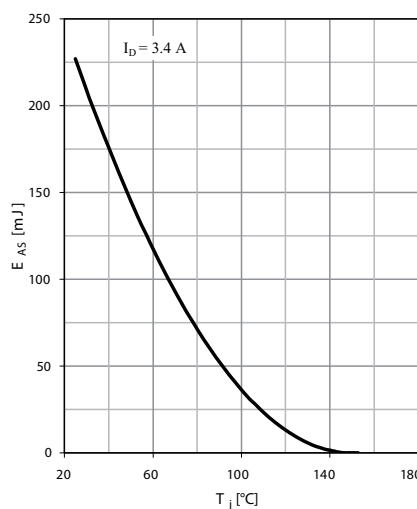


Fig. 10 Avalanche energy

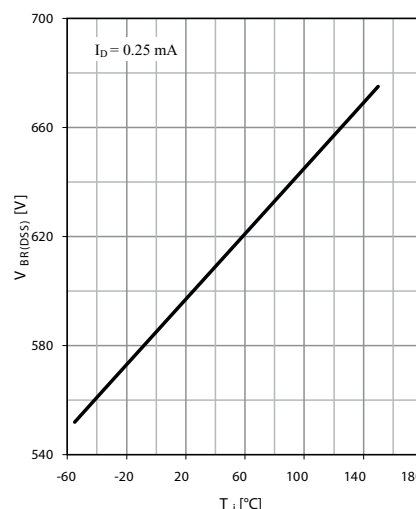


Fig. 11 Drain-source breakdown voltage

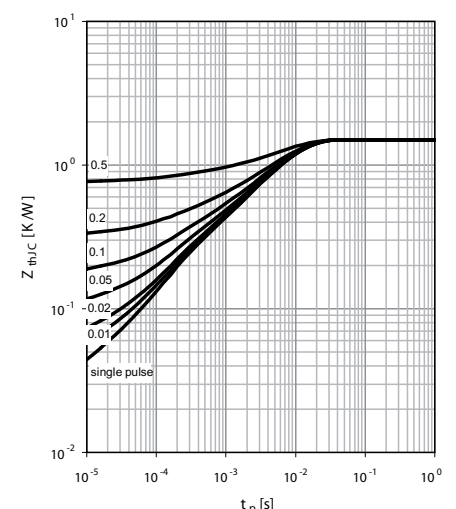


Fig. 12 Max. transient thermal impedance