

CoolMOS™ 1) Power MOSFET

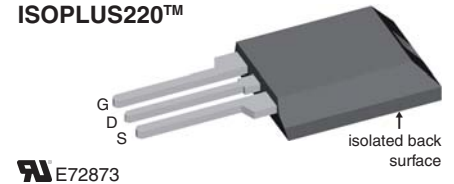
Electrically isolated back surface
 2500 V electrical isolation
 N-Channel Enhancement Mode
 Low $R_{DS(on)}$, high V_{DSS} MOSFET
 Ultra low gate charge



$$I_{D25} = 19 \text{ A}$$

$$V_{DSS} = 600 \text{ V}$$

$$R_{DS(on) \text{ max}} = 0.125 \Omega$$

ISOPLUS220™


| MOSFET | | | |
|-----------|---|-----------------|------|
| Symbol | Conditions | Maximum Ratings | |
| V_{DSS} | $T_{VJ} = 25^\circ\text{C}$ | 600 | V |
| V_{GS} | | ± 20 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 19 | A |
| I_{D90} | $T_C = 90^\circ\text{C}$ | 15 | A |
| E_{AS} | single pulse } $I_D = 11 \text{ A}; T_C = 25^\circ\text{C}$ repetitive | 708 | mJ |
| E_{AR} | | 1.2 | mJ |
| dV/dt | MOSFET dV/dt ruggedness $V_{DS} = 0 \dots 480 \text{ V}$ | 50 | V/ns |

Features

- Silicon chip on Direct-Copper-Bond substrate
 - high power dissipation
 - isolated mounting surface
 - 2500 V electrical isolation
 - low drain to tab capacitance ($< 30 \text{ pF}$)
- Fast CoolMOS™ 1) 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

Advantages

- Easy assembly: no screws or isolation foils required
- Space savings
- High power density
- High reliability

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

| Symbol | Conditions | Characteristic Values | | | |
|--------------|---|-----------------------|------|------|---------------|
| | | min. | typ. | max. | |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}; I_D = 16 \text{ A}$ | | 110 | 125 | m Ω |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}; I_D = 1.1 \text{ mA}$ | 2.5 | 3 | 3.5 | V |
| I_{DSS} | $V_{DS} = 600 \text{ V}; V_{GS} = 0 \text{ V}$ | | | 2 | μA |
| | $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$ | | 20 | | μA |
| I_{GSS} | $V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$ | | | 100 | nA |
| C_{iss} | $V_{GS} = 0 \text{ V}; V_{DS} = 100 \text{ V}$ $f = 1 \text{ MHz}$ | | 2500 | | pF |
| C_{oss} | | | 120 | | pF |
| Q_g | $V_{GS} = 0 \text{ to } 10 \text{ V}; V_{DS} = 400 \text{ V}; I_D = 12 \text{ A}$ | | 53 | 70 | nC |
| Q_{gs} | | | 12 | | nC |
| Q_{gd} | | | 18 | | nC |
| $t_{d(on)}$ | $V_{GS} = 10 \text{ V}; V_{DS} = 400 \text{ V}$ $I_D = 16 \text{ A}; R_G = 3.3 \Omega$ | | 15 | | ns |
| t_r | | | 5 | | ns |
| $t_{d(off)}$ | | | 50 | | ns |
| t_f | | | 5 | | ns |
| R_{thJC} | | | 0.95 | | K/W |

Source-Drain Diode

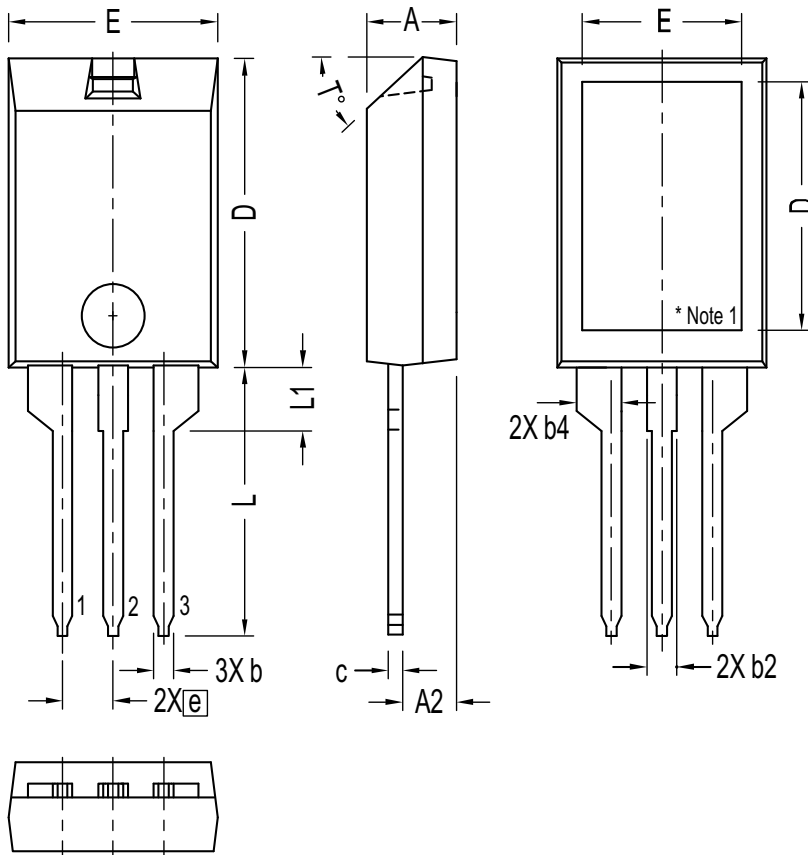
| Symbol | Conditions | Characteristic Values | | |
|---|--|-----------------------|------|---------------|
| | | min. | typ. | max. |
| ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified) | | | | |
| I_S | $V_{GS} = 0\text{ V}$ | | 16 | A |
| V_{SD} | $I_F = 16\text{ A}; V_{GS} = 0\text{ V}$ | 0.9 | 1.2 | V |
| t_{rr} | $I_F = 16\text{ A}; -di_F/dt = 100\text{ A}/\mu\text{s}; V_R = 400\text{ V}$ | 430 | | ns |
| Q_{RM} | | 9 | | μC |
| I_{RM} | | 42 | | A |

Component

| Symbol | Conditions | Maximum Ratings | | |
|------------|--|-----------------|------|--------------------|
| | | min. | typ. | max. |
| T_{VJ} | operating | -55...+150 | | $^{\circ}\text{C}$ |
| T_{stg} | storage | -55...+150 | | $^{\circ}\text{C}$ |
| V_{ISOL} | RMS leads-to-tab, 50/60 Hz, $f = 1$ minute | | 2500 | V~ |
| F_C | mounting force | 11-65 / 2.4-11 | | N/lb |

| Symbol | Conditions | Characteristic Values | | |
|------------|------------------------|-----------------------|------|------|
| | | min. | typ. | max. |
| R_{thCH} | with heatsink compound | 0.3 | | K/W |
| Weight | | 2.7 | | g |

ISOPLUS220™ Outline



| SYM | INCHES | | MILLIMETERS | |
|-----|------------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .157 | .197 | 4.00 | 5.00 |
| A2 | .098 | .118 | 2.50 | 3.00 |
| b | .035 | .051 | 0.90 | 1.30 |
| b2 | .049 | .065 | 1.25 | 1.65 |
| b4 | .093 | .100 | 2.35 | 2.55 |
| c | .028 | .039 | 0.70 | 1.00 |
| D | .591 | .630 | 15.00 | 16.00 |
| D1 | .472 | .512 | 12.00 | 13.00 |
| E | .394 | .433 | 10.00 | 11.00 |
| E1 | .295 | .335 | 7.50 | 8.50 |
| e | .100 BASIC | | 2.55 | BASIC |
| L | .512 | .571 | 13.00 | 14.50 |
| L1 | .118 | .138 | 3.00 | 3.50 |
| T° | | | 42.5° | 47.5° |

NOTE:
 1. Bottom heatsink is electrically isolated from Pin 1, 2, or 3.
 2. This drawing will meet dimensional requirement of JEDEC SS Product Outline TO-273 except D and D1 dimension.

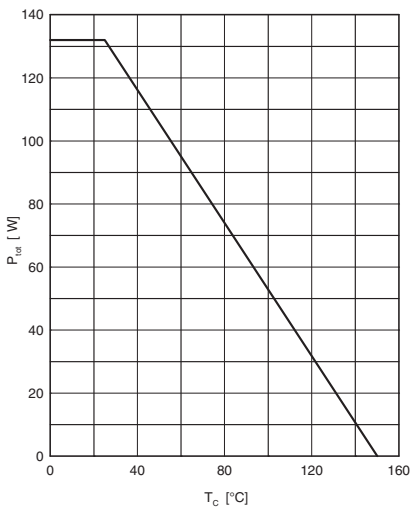


Fig. 1 Power dissipation

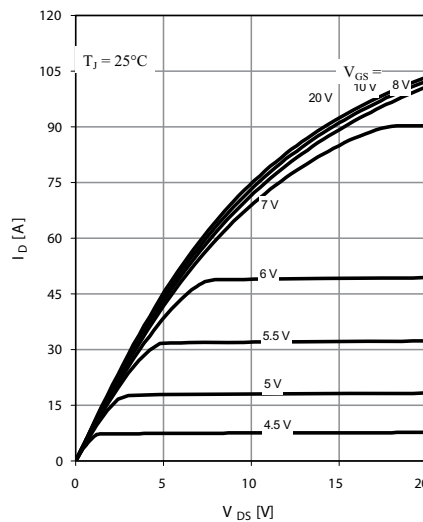


Fig. 2 Typ. output characteristics

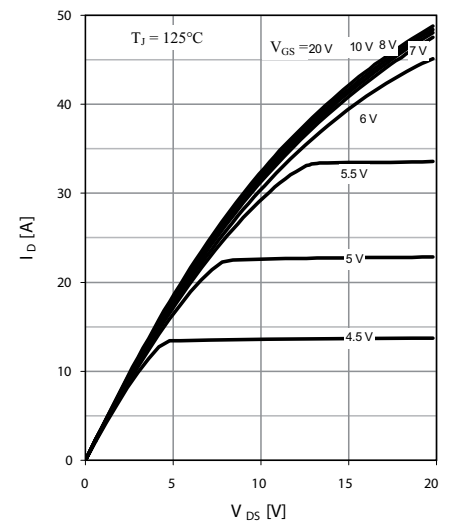


Fig. 3 Typ. output characteristics

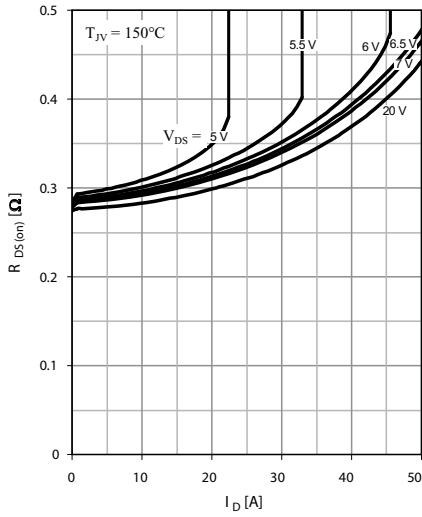


Fig. 4 Typ. drain-source on-state resistance

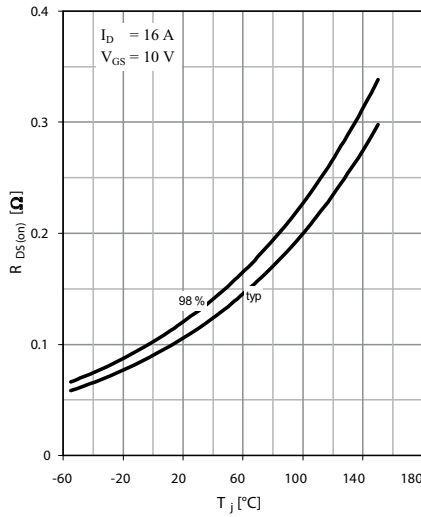


Fig. 5 Drain-source on-state resistance

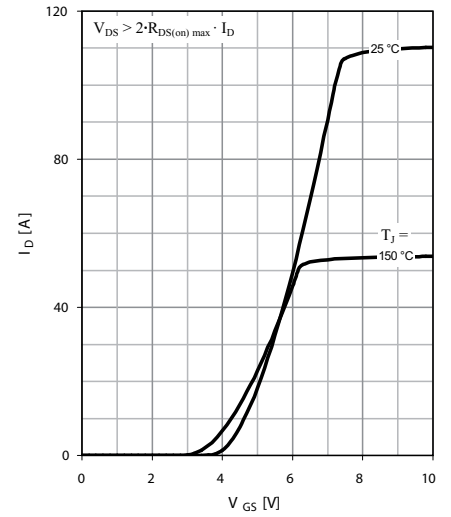


Fig. 6 Typ. transfer characteristics

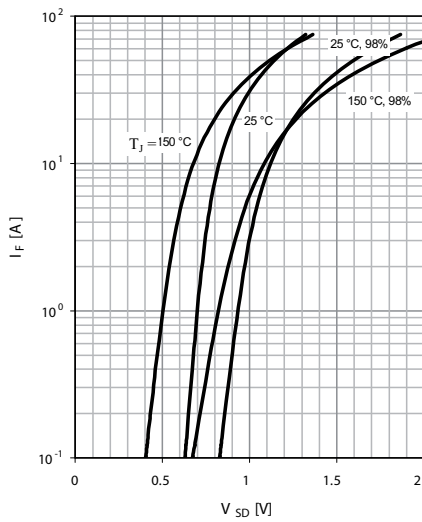


Fig. 7 Forward characteristic of reverse diode

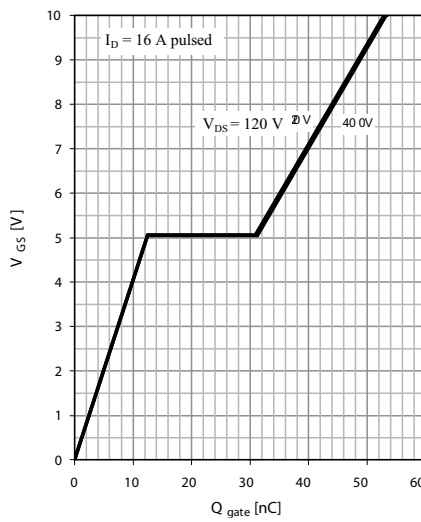


Fig. 8 Typ. gate charge

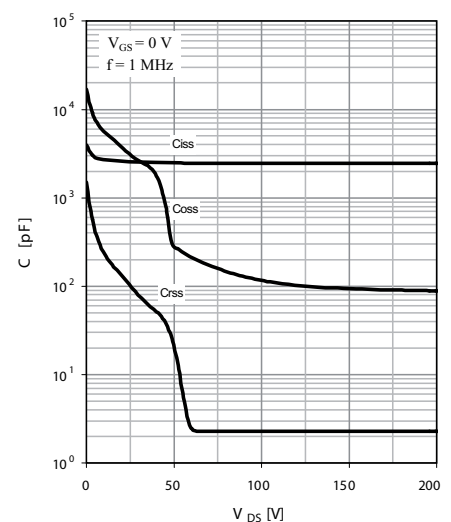


Fig. 9 Typ. capacitances

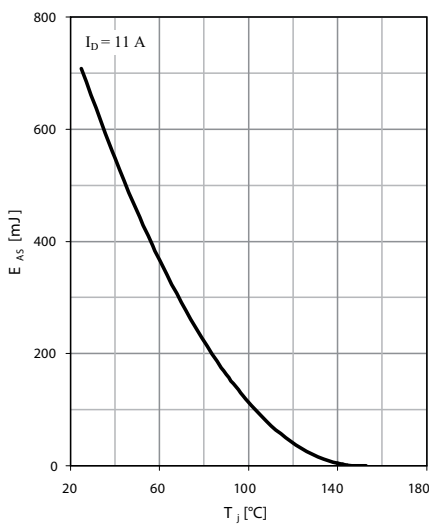


Fig. 10 Avalanche energy

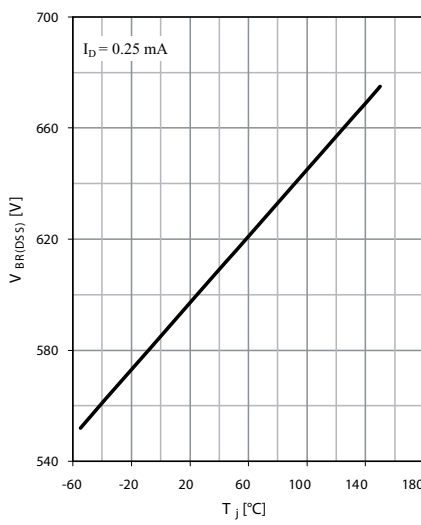


Fig. 11 Drain-source breakdown voltage



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