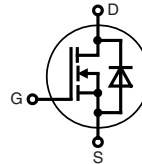


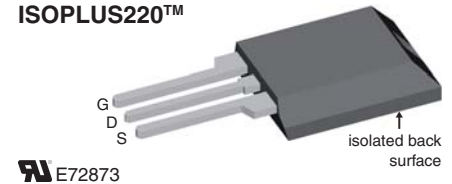
CoolMOS™<sup>1)</sup> Power MOSFET

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



$$\begin{aligned} I_{D25} &= 15 \text{ A} \\ V_{DSS} &= 600 \text{ V} \\ R_{DS(on) \text{ max}} &= 0.165 \Omega \end{aligned}$$

ISOPLUS220™



E72873

| MOSFET    |                                                                            |                 |  |      |
|-----------|----------------------------------------------------------------------------|-----------------|--|------|
| Symbol    | Conditions                                                                 | Maximum Ratings |  |      |
| $V_{DSS}$ | $T_{VJ} = 25^\circ\text{C}$                                                | 600             |  | V    |
| $V_{GS}$  |                                                                            | $\pm 20$        |  | V    |
| $I_{D25}$ | $T_C = 25^\circ\text{C}$                                                   | 15              |  | A    |
| $I_{D90}$ | $T_C = 90^\circ\text{C}$                                                   | 11              |  | A    |
| $E_{AS}$  | single pulse<br>repetitive } $I_D = 7.9 \text{ A}; T_C = 25^\circ\text{C}$ | 522             |  | mJ   |
| $E_{AR}$  |                                                                            | 0.79            |  | mJ   |
| $dV/dt$   | MOSFET $dV/dt$ ruggedness $V_{DS} = 0 \dots 480 \text{ V}$                 | 50              |  | V/ns |

| Symbol       | Conditions                                                                                | Characteristic Values                                             |      |      |               |
|--------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------|------|---------------|
|              |                                                                                           | $(T_{VJ} = 25^\circ\text{C}, \text{ unless otherwise specified})$ |      |      |               |
|              |                                                                                           | min.                                                              | typ. | max. |               |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}; I_D = 12 \text{ A}$                                               |                                                                   | 150  | 165  | m $\Omega$    |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}; I_D = 0.79 \text{ mA}$                                                  | 2.5                                                               | 3    | 3.5  | V             |
| $I_{DSS}$    | $V_{DS} = 600 \text{ V}; V_{GS} = 0 \text{ V}$                                            |                                                                   |      | 1    | $\mu\text{A}$ |
|              | $T_{VJ} = 25^\circ\text{C}$<br>$T_{VJ} = 125^\circ\text{C}$                               |                                                                   | 10   |      | $\mu\text{A}$ |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$                                         |                                                                   |      | 100  | nA            |
| $C_{iss}$    | $V_{GS} = 0 \text{ V}; V_{DS} = 100 \text{ V}$<br>$f = 1 \text{ MHz}$                     |                                                                   | 2000 |      | pF            |
| $C_{oss}$    |                                                                                           |                                                                   | 100  |      | pF            |
| $Q_g$        | $V_{GS} = 0 \text{ to } 10 \text{ V}; V_{DS} = 400 \text{ V}; I_D = 12 \text{ A}$         |                                                                   | 40   | 52   | nC            |
| $Q_{gs}$     |                                                                                           |                                                                   | 9    |      | nC            |
| $Q_{gd}$     |                                                                                           |                                                                   | 13   |      | nC            |
| $t_{d(on)}$  | $V_{GS} = 10 \text{ V}; V_{DS} = 400 \text{ V}$<br>$I_D = 12 \text{ A}; R_G = 3.3 \Omega$ |                                                                   | 12   |      | ns            |
| $t_r$        |                                                                                           |                                                                   | 5    |      | ns            |
| $t_{d(off)}$ |                                                                                           |                                                                   | 50   |      | ns            |
| $t_f$        |                                                                                           |                                                                   | 5    |      | ns            |
| $R_{thJC}$   |                                                                                           |                                                                   |      | 1.1  | K/W           |

## 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™<sup>1)</sup> 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

## Advantages

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

<sup>1)</sup> CoolMOS™ is a trademark of Infineon Technologies AG.

**Source-Drain Diode**

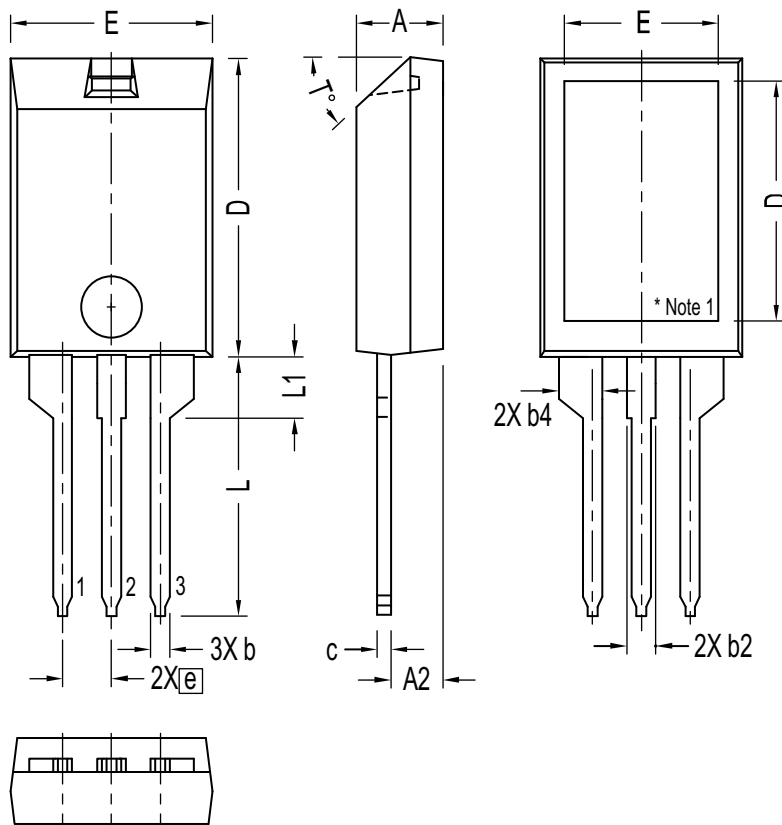
| Symbol          | Conditions                                                                     | Characteristic Values                                |      |      |    |
|-----------------|--------------------------------------------------------------------------------|------------------------------------------------------|------|------|----|
|                 |                                                                                | (T <sub>VJ</sub> = 25°C, unless otherwise specified) |      |      |    |
|                 |                                                                                | min.                                                 | typ. | max. |    |
| I <sub>S</sub>  | V <sub>GS</sub> = 0 V                                                          |                                                      |      | 12   | A  |
| V <sub>SD</sub> | I <sub>F</sub> = 12 A; V <sub>GS</sub> = 0 V                                   |                                                      | 0.9  | 1.2  | V  |
| t <sub>rr</sub> | I <sub>F</sub> = 12 A; -di <sub>F</sub> /dt = 100 A/μs; V <sub>R</sub> = 400 V |                                                      | 390  |      | ns |
| Q <sub>RM</sub> |                                                                                |                                                      | 7.5  |      | μC |
| I <sub>RM</sub> |                                                                                |                                                      | 38   |      | A  |

**Component**

| Symbol            | Conditions                               | Maximum Ratings |      |
|-------------------|------------------------------------------|-----------------|------|
| T <sub>VJ</sub>   | operating                                | -55...+150      | °C   |
| T <sub>stg</sub>  | storage                                  | -55...+150      | °C   |
| V <sub>ISOL</sub> | RMS leads-to-tab, 50/60 Hz, f = 1 minute | 2500            | V~   |
| F <sub>C</sub>    | mounting force                           | 11-65 / 2.4-11  | N/lb |

| Symbol            | Conditions             | Characteristic Values |      |      |     |
|-------------------|------------------------|-----------------------|------|------|-----|
|                   |                        | min.                  | typ. | max. |     |
| R <sub>thCH</sub> | with heatsink compound |                       | 0.35 |      | 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.

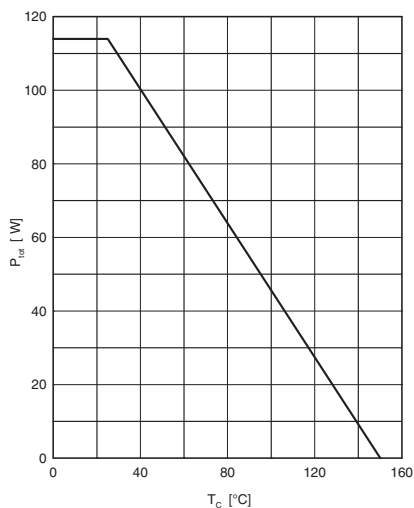


Fig. 1 Power dissipation

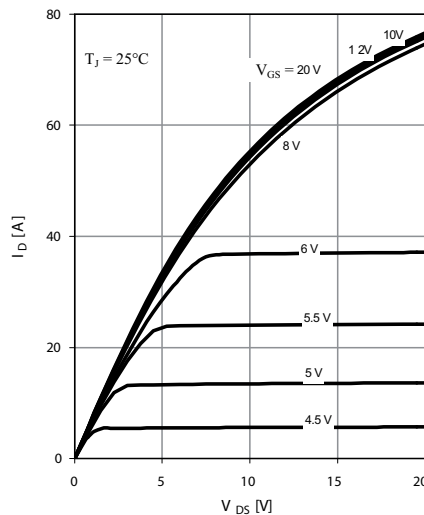


Fig. 2 Typ. output characteristics

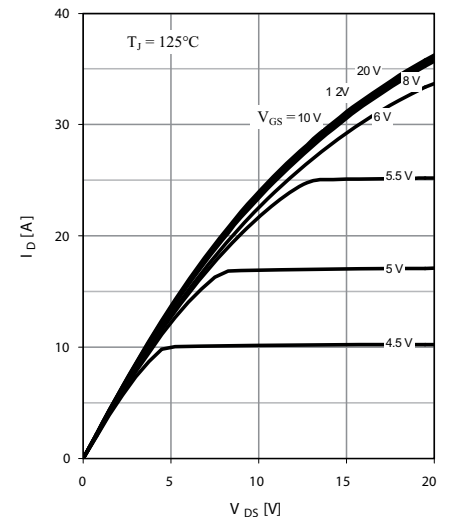


Fig. 3 Typ. output characteristics

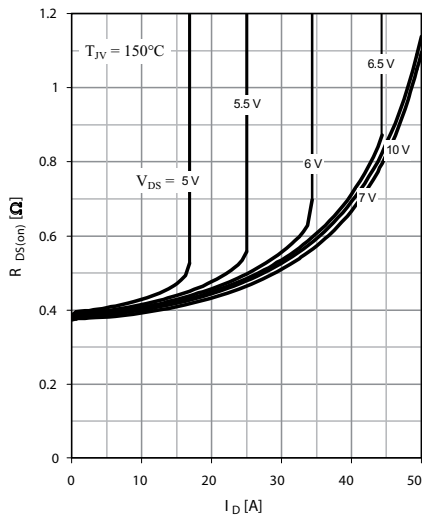


Fig. 4 Typ. drain-source on-state resistance

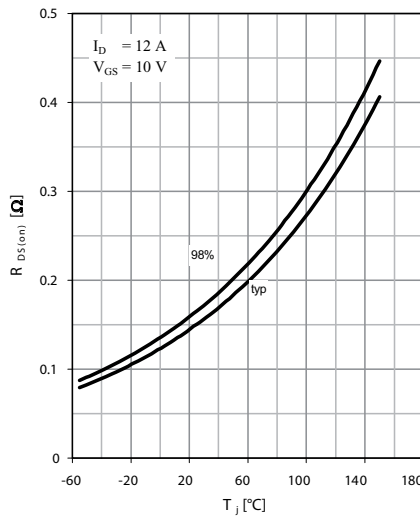


Fig. 5 Drain-source on-state resistance

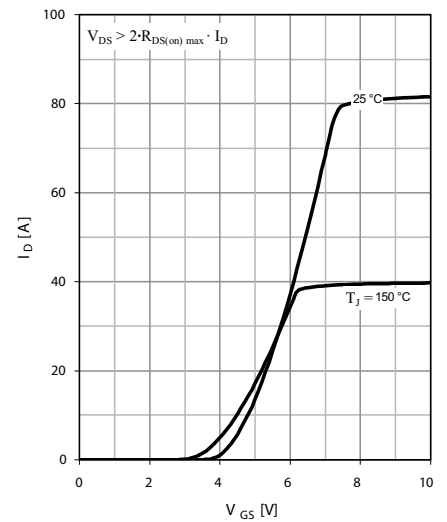


Fig. 6 Typ. transfer characteristics

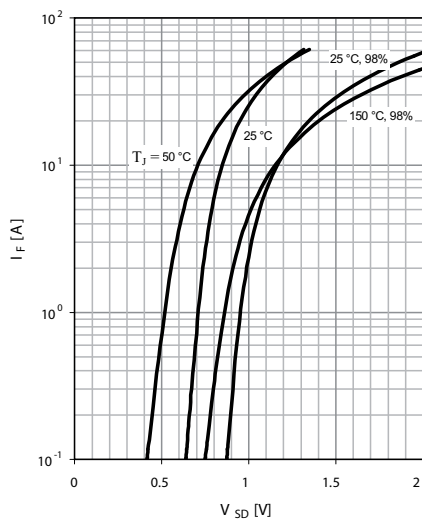


Fig. 7 Forward characteristic of reverse diode

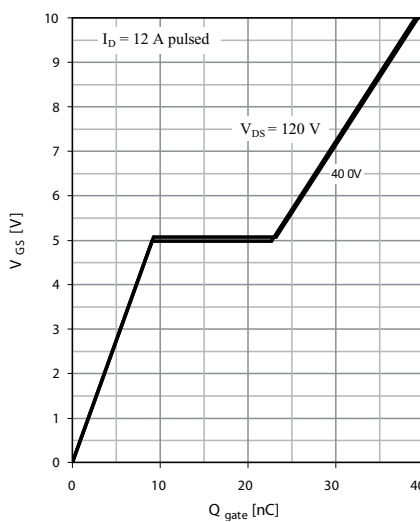


Fig. 8 Typ. gate charge

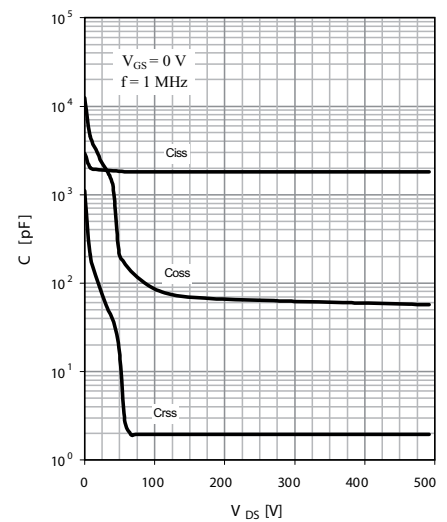


Fig. 9 Typ. capacitances

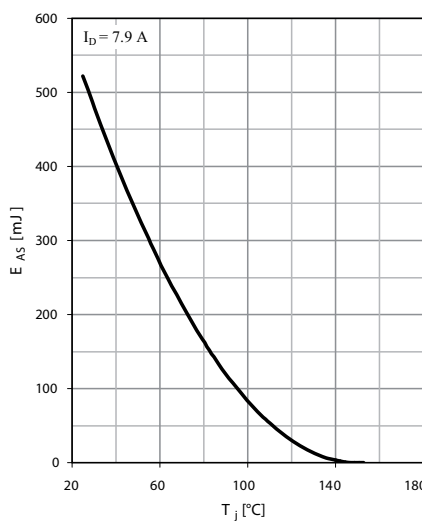


Fig. 10 Avalanche energy

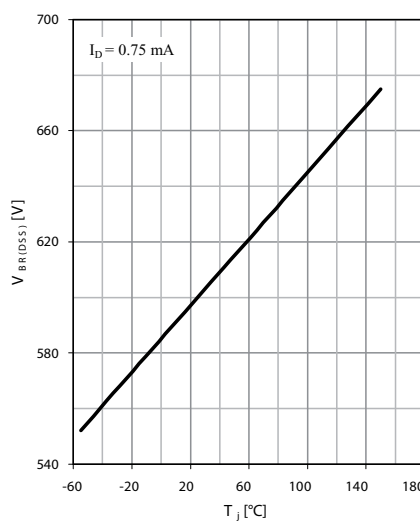


Fig. 11 Drain-source breakdown voltage

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