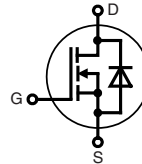
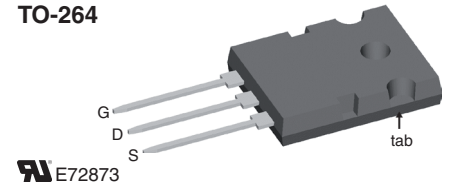


# CoolMOS™ 1) Power MOSFET

Low  $R_{DS(on)}$ , high  $V_{DSS}$   
Superjunction MOSFET

$V_{DSS} = 600\text{ V}$   
 $I_{D25} = 85\text{ A}$   
 $R_{DS(on) \text{ max}} = 36\text{ m}\Omega$


**TO-264**


| MOSFET     |   |                 |      |
|------------|---|-----------------|------|
| Symbol     | Conditions  | Maximum Ratings |      |
| $V_{DSS}$  | $T_{VJ} = 25^\circ\text{C}$                               | 600             | V    |
| $V_{GS}$   |   | $\pm 20$        | V    |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$                                  | 85              | A    |
| $I_{D100}$ | $T_C = 100^\circ\text{C}$                                 | 55              | A    |
| $E_{AS}$   | single pulse $I_D = 10\text{ A}; T_C = 25^\circ\text{C}$  | 1800            | mJ   |
| $E_{AR}$   | repetitive $I_D = 20\text{ A}; T_C = 25^\circ\text{C}$    | 1               | mJ   |
| $dV/dt$    | MOSFET $dV/dt$ ruggedness $V_{DS} = 0 \dots 480\text{ V}$ | 50              | V/ns |

**Features**

- 3<sup>rd</sup> generation CoolMOS™ 1) power MOSFET
- high blocking capability
- lowest resistance
- avalanche rated for unclamped inductive switching (UIS)
- low thermal resistance due to reduced chip thickness

**Applications**

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

| Symbol       | Conditions  | Characteristic Values   |      |           |               |
|--------------|---|---|------|-----------|---------------|
|              |   | $(T_{VJ} = 25^\circ\text{C}, \text{ unless otherwise specified})$ |      |           |               |
|              |   | min.  | typ. | max.      |               |
| $R_{DS(on)}$ | $V_{GS} = 10\text{ V}; I_D = I_{D100}$ ①  |   | 30   | 36        | m $\Omega$    |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}; I_D = 5.4\text{ mA}$  | 2   |      | 4         | V             |
| $I_{DSS}$    | $V_{DS} = V_{DSS}; V_{GS} = 0\text{ V}$   |   |      | 50        | $\mu\text{A}$ |
|              |   |   |      | 500       | $\mu\text{A}$ |
| $I_{GSS}$    | $V_{GS} = \pm 20\text{ V}; V_{DS} = 0\text{ V}$   |   |      | $\pm 200$ | nA            |
| $C_{iss}$    | } $V_{GS} = 0\text{ V}; V_{DS} = 25\text{ V}$<br>$f = 1\text{ MHz}$                       |   | 13.6 |           | nF            |
| $C_{oss}$    |   |   | 4.4  |           | nF            |
| $C_{rss}$    |   |   | 290  |           | pF            |
| $Q_g$        | } $V_{GS} = 0\text{ to }10\text{ V}; V_{DS} = 350\text{ V}; I_D = 85\text{ A}$            |   | 500  | 640       | nC            |
| $Q_{gs}$     |   |   | 50   |           | nC            |
| $Q_{gd}$     |   |   | 240  |           | nC            |
| $t_{d(on)}$  | } $V_{GS} = 13\text{ V}; V_{DS} = 380\text{ V}$<br>$I_D = 85\text{ A}; R_G = 1.0\ \Omega$ |   | 20   |           | ns            |
| $t_r$        |   |   | 27   |           | ns            |
| $t_{d(off)}$ |   |   | 110  |           | ns            |
| $t_f$        |   |   | 10   |           | ns            |
| $R_{thJC}$   |   |   | 0.18 |           | K/W           |

① Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $d \leq 2\%$

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

### Source-Drain Diode

| Symbol   | Conditions   | Characteristic Values |      |      |               |
|----------|--|-----------------------|------|------|---------------|
|          |  | min.                  | typ. | max. |               |
| $I_S$    | $V_{GS} = 0\text{ V}$  |                       |      | 85   | A             |
| $I_{SM}$ |  |                       |      | 250  | A             |
| $V_{SD}$ | $I_F = 85\text{ A}; V_{GS} = 0\text{ V}$                                     |                       |      | 1.2  | V             |
| $t_{rr}$ | $I_F = 85\text{ A}; -di_F/dt = 200\text{ A}/\mu\text{s}; V_R = 350\text{ V}$ |                       | 580  |      | ns            |
| $Q_{RM}$ |  |                       | 46   |      | $\mu\text{C}$ |
| $I_{RM}$ |  |                       | 140  |      | A             |

( $T_{VJ} = 25^\circ\text{C}$ , unless otherwise specified)

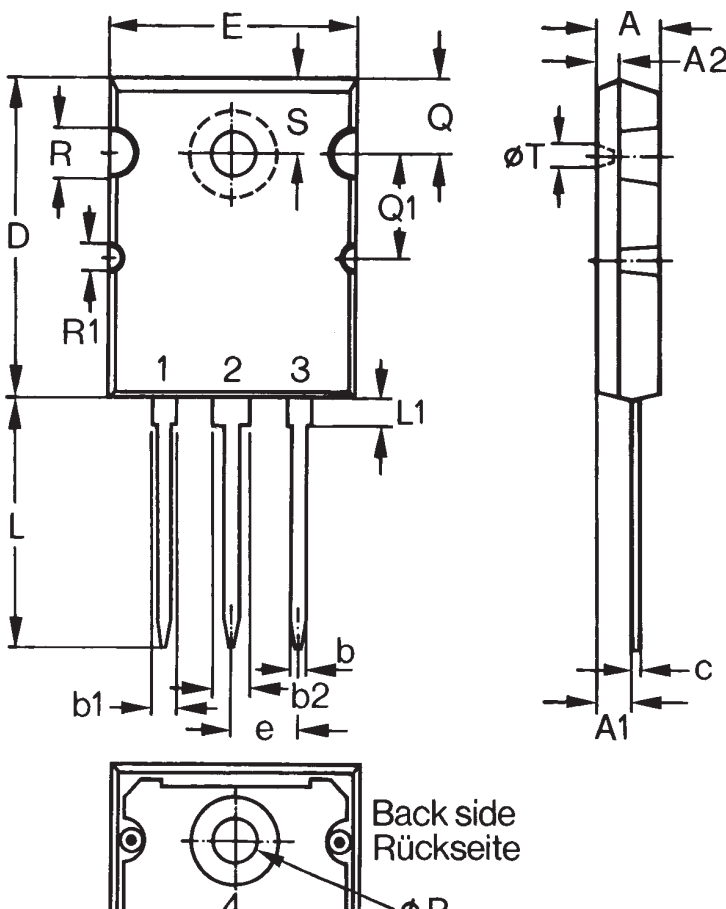
### Component

| Symbol    | Conditions      | Maximum Ratings |             |                  |
|-----------|-----------------|-----------------|-------------|------------------|
|           |                 | min.            | typ.        | max.             |
| $T_{VJ}$  | operating       |                 | -55...+150  | $^\circ\text{C}$ |
| $T_{stg}$ |                 |                 | -55...+150  | $^\circ\text{C}$ |
| $M_d$     | mounting torque |                 | 0.8 ... 1.2 | Nm               |

| Symbol     | Conditions             | Characteristic Values |      |      |
|------------|------------------------|-----------------------|------|------|
|            |                        | min.                  | typ. | max. |
| $R_{thCH}$ | with heatsink compound |                       | 0.15 | K/W  |
| Weight     |                        |                       | 10   | g    |

### TO-264 Outline

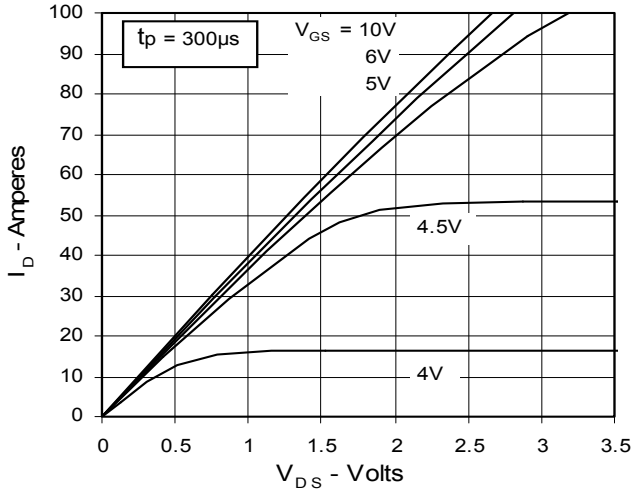


| SYM       | INCHES   |       | MILLIMETERS |       |
|-----------|----------|-------|-------------|-------|
|           | MIN      | MAX   | MIN         | MAX   |
| A         | .185     | .209  | 4.70        | 5.31  |
| A1        | .102     | .118  | 2.59        | 3.00  |
| b         | .037     | .055  | 0.94        | 1.40  |
| b1        | .087     | .102  | 2.21        | 2.59  |
| b2        | .110     | .126  | 2.79        | 3.20  |
| C         | .017     | .029  | 0.43        | 0.74  |
| D         | 1.007    | 1.047 | 25.58       | 26.59 |
| E         | .760     | .799  | 19.30       | 20.29 |
| e         | .215 BSC |       | 5.46 BSC    |       |
| L         | .193     | .201  | 4.90        | 5.10  |
| L1        | .088     | .096  | 2.24        | 2.44  |
| L2        | .075     | .083  | 1.90        | 2.10  |
| L3        | .000     | .004  | 0.00        | 0.10  |
| $\phi P$  | .122     | .138  | 3.10        | 3.51  |
| Q         | .240     | .256  | 6.10        | 6.50  |
| Q1        | .330     | .346  | 8.38        | 8.79  |
| $\phi R$  | .155     | .187  | 3.94        | 4.75  |
| $\phi R1$ | .085     | .093  | 2.16        | 2.36  |
| S         | .243     | .253  | 6.17        | 6.43  |

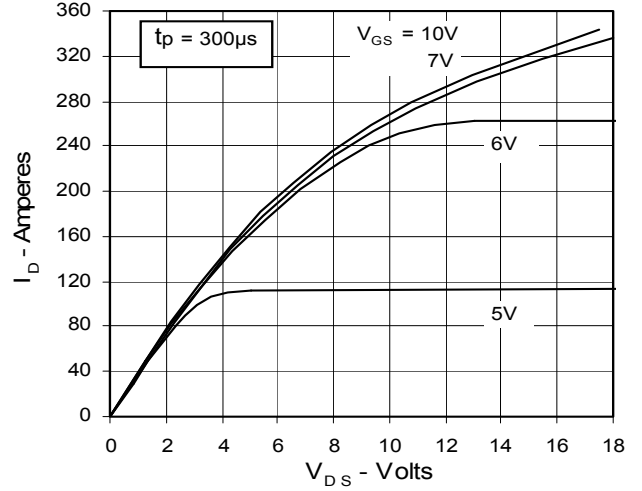
NOTE 1. This drawing meets all dimension requirement of JEDEC outline TO-264A except L, L1, L2, L3

2. All metal surface are solder patted except trimmed area

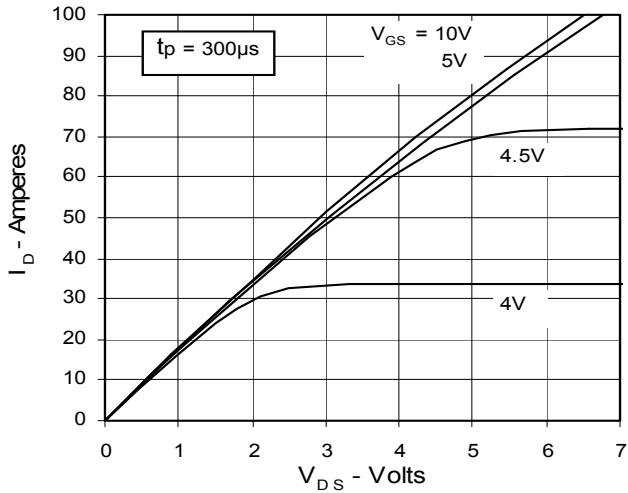
**Fig. 1. Output Characteristics @ 25 Deg. C**



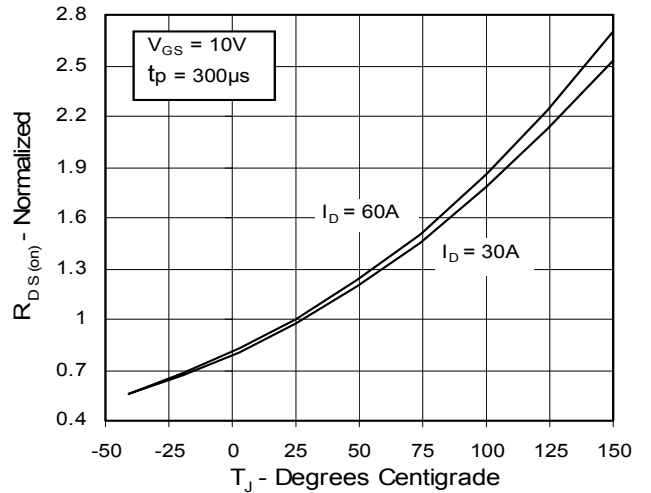
**Fig. 2. Extended Output Characteristics @ 25 deg. C**



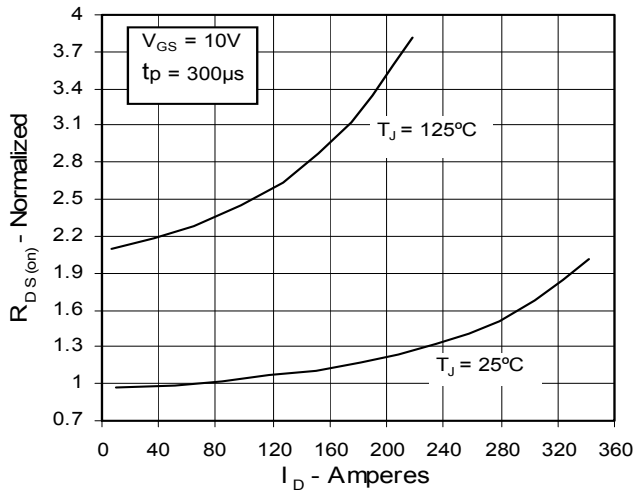
**Fig. 3. Output Characteristics @ 125 Deg. C**



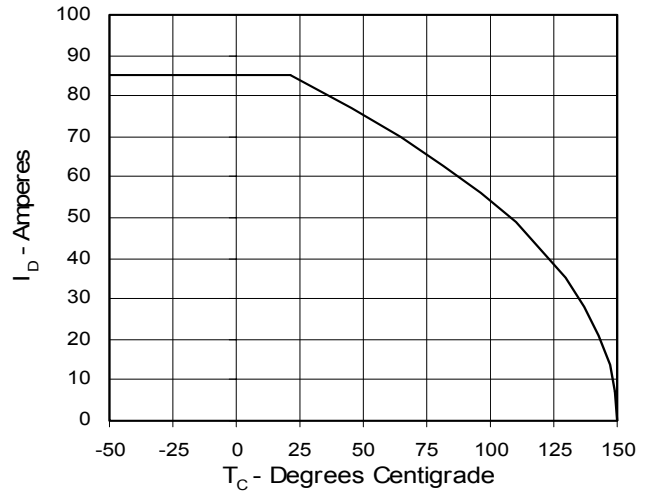
**Fig. 4. R\_DS(on) Normalized to I\_D100 Value vs. Junction Temperature**



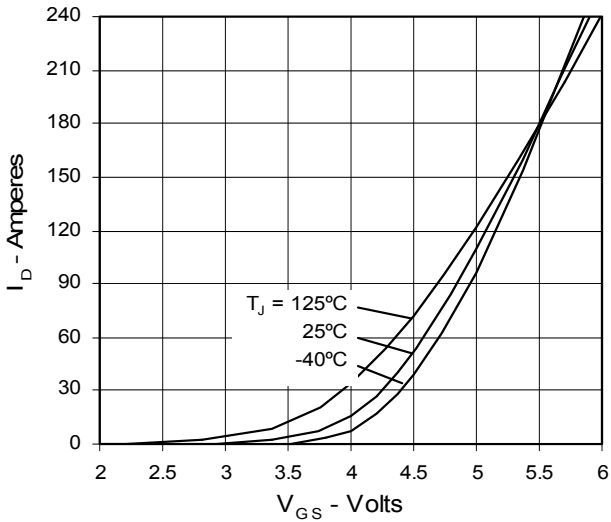
**Fig. 5. R\_DS(on) Normalized to I\_D100 Value vs. I\_D**



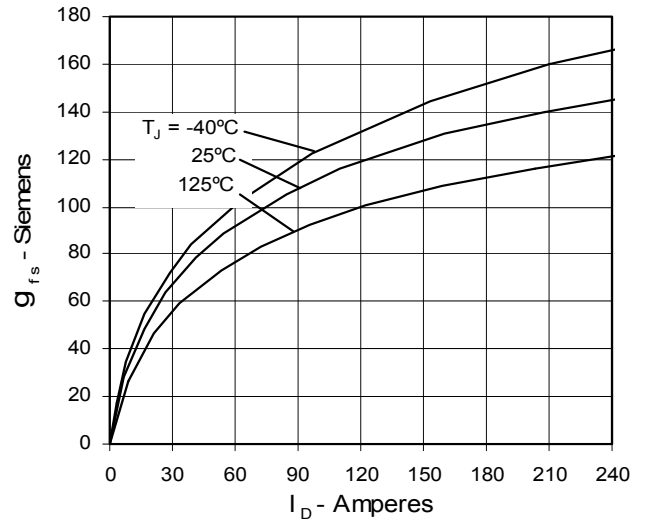
**Fig. 6. Drain Current vs. Case Temperature**



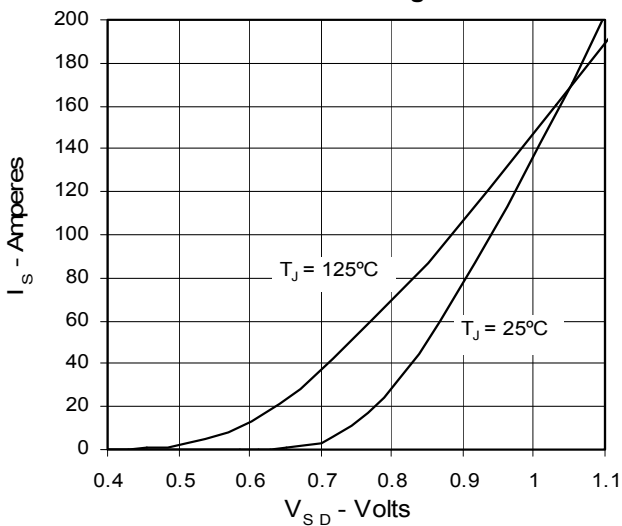
**Fig. 7. Input Admittance**



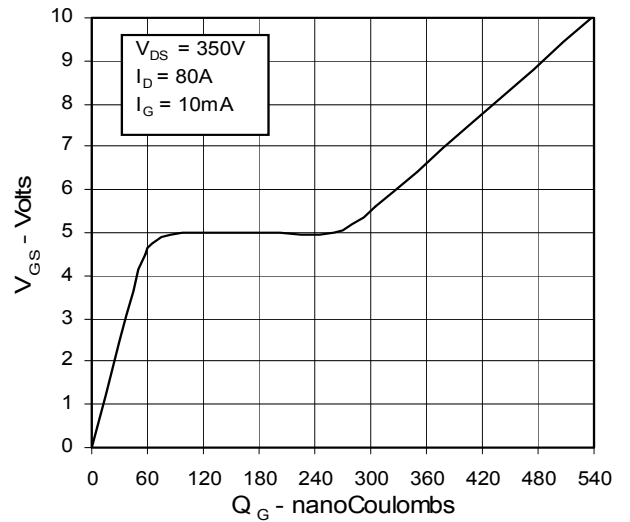
**Fig. 8. Transconductance**



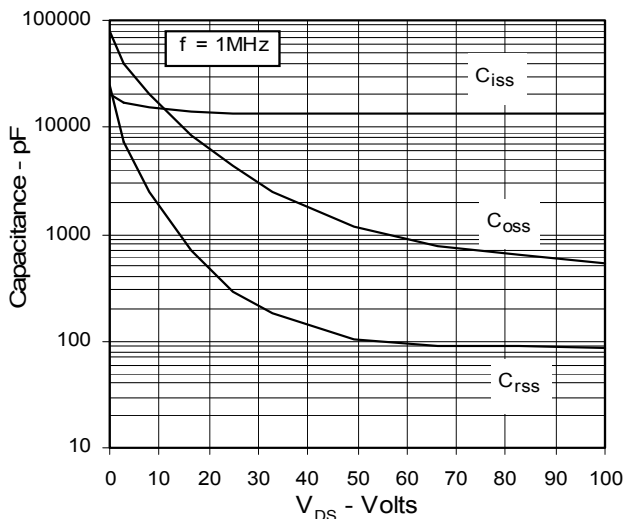
**Fig. 9. Source Current vs. Source-To-Drain Voltage**



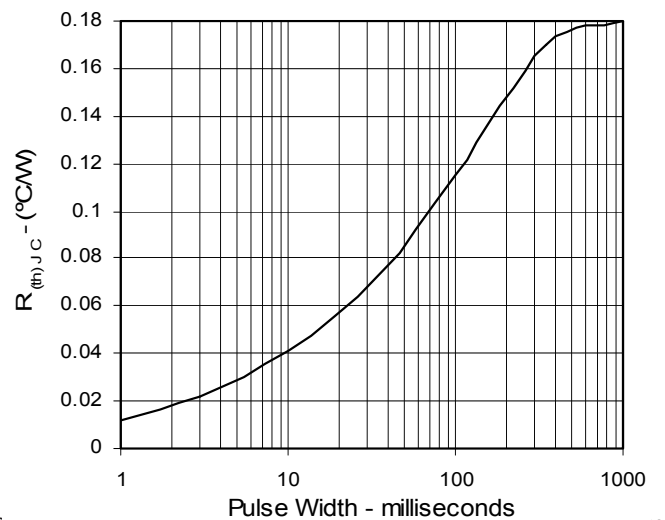
**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



**Fig. 12. Maximum Transient Thermal Resistance**



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