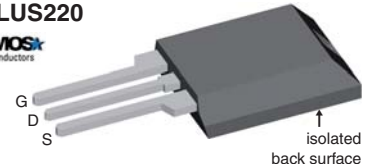


# CoolMOS™ 1) Power MOSFET ISOPLUS™ Package

N-Channel Enhancement Mode  
Low  $R_{DS(on)}$ , high  $V_{DSS}$  MOSFET  
Electrically Isolated Back Surface

$I_{D25} = 25 \text{ A}$   
 $V_{DSS} = 800 \text{ V}$   
 $R_{DS(on) \text{ max}} = 150 \text{ m}\Omega$


**ISOPLUS220**
**COOLMOS™**  
Power Semiconductors


E72873

MOSFET			
Symbol	Conditions	Maximum Ratings	
$V_{DSS}$	$T_{VJ} = 25^\circ\text{C}$	800	V
$V_{GS}$		$\pm 20$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	25	A
$I_{D90}$	$T_C = 90^\circ\text{C}$	18	A
$E_{AS}$	$T_{J \text{ start}} = 25^\circ\text{C}$ ; single pulse; $I_D = 3.4 \text{ A}$	670	mJ
$E_{AR}$	$T_{J \text{ start}} = 25^\circ\text{C}$ ; repetitive; $I_D = 17 \text{ A}$	0.5	mJ
$dV/dt$	$V_{DS} < V_{DSS}$ ; $I_F = 35 \text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$ $dI_R/dt = 100 \text{ A}/\mu\text{s}$	6	V/ns

**Features**

- Silicon chip on Direct-Copper-Bond substrate
  - high power dissipation
  - isolated mounting surface
  - 2500 V electrical isolation
- 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
- Low drain to tab capacitance (<30 pF)

**Applications**

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

**Advantages**

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

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

Symbol	Conditions	Characteristic Values			
		(T <sub>VJ</sub> = 25°C, unless otherwise specified)			
		min.	typ.	max.	
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$ ; $I_D = I_{D90}$		135	150	mΩ
$V_{GS(th)}$	$V_{DS} = V_{GS}$ ; $I_D = 2 \text{ mA}$	2		4	V
$I_{DSS}$	$V_{DS} = V_{DSS}$ ; $V_{GS} = 0 \text{ V}$			50	μA
			250		μA
$I_{GSS}$	$V_{GS} = \pm 20 \text{ V}$ ; $V_{DS} = 0 \text{ V}$			$\pm 200$	nA
$C_{iss}$	$V_{GS} = 0 \text{ V}$ ; $V_{DS} = 25 \text{ V}$ ; $f = 1 \text{ MHz}$		4600		pF
$C_{oss}$			2500		pF
$C_{rss}$			120		pF
$Q_g$	$V_{GS} = 0 \text{ to } 10 \text{ V}$ ; $V_{DS} = 640 \text{ V}$ ; $I_D = I_{D90}$		180		nC
$Q_{gs}$			20		nC
$Q_{gd}$			80		nC
$t_{d(on)}$	$V_{GS} = 10 \text{ V}$ ; $V_{DS} = 640 \text{ V}$ ; $T_{VJ} = 125^\circ\text{C}$ $I_D = 35 \text{ A}$ ; $R_G = 2.2 \Omega$		25		ns
$t_r$			25		ns
$t_{d(off)}$			75		ns
$t_f$			10		ns
$R_{thJC}$			0.5		K/W

**Source-Drain Diode**

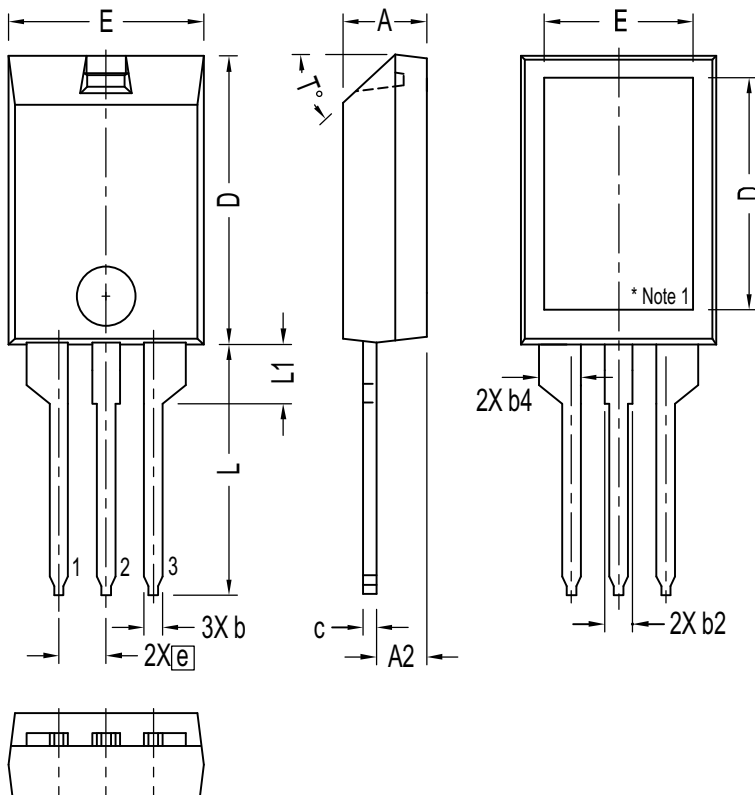
Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
( $T_{VJ} = 25^{\circ}\text{C}$ , unless otherwise specified)					
$I_S$	$V_{GS} = 0\text{ V}$			34	A
$V_{SD}$	$I_F = 35\text{ A}; V_{GS} = 0\text{ V}$		1.0	1.2	V
$t_{rr}$	} $I_F = 35\text{ A}; -di_F/dt = 200\text{ A}/\mu\text{s}; V_R = 400\text{ V}$		550		ns
$Q_{RM}$			30		$\mu\text{C}$
$I_{RM}$			100		A

**Component**

Symbol	Conditions	Maximum Ratings	
$T_{VJ}$	operating	-55...+150	$^{\circ}\text{C}$
$T_{stg}$		-55...+150	$^{\circ}\text{C}$
$V_{ISOL}$	RMS, lead-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	0.15		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.

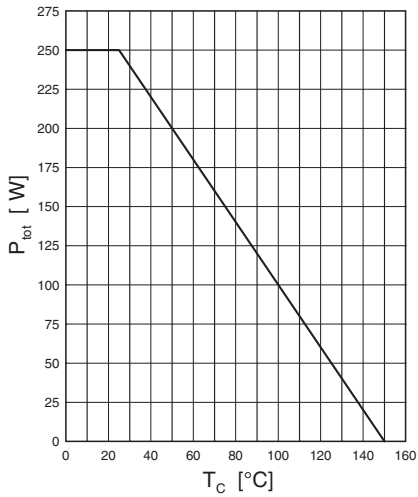


Fig. 1 Power Dissipation

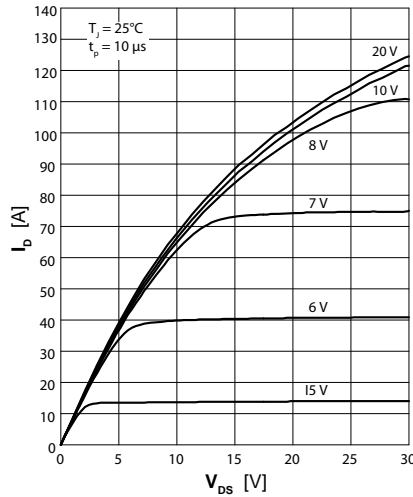


Fig. 2 Typ. Output Characteristics

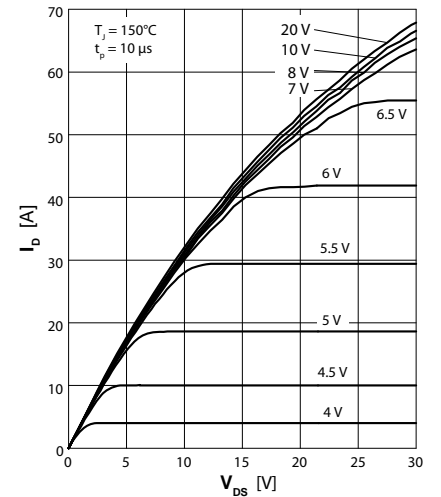


Fig. 3 Typ. Output Characteristics

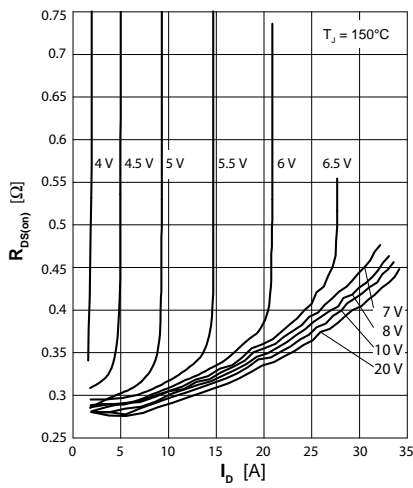


Fig. 4 Typ. Drain-Source on Resistance

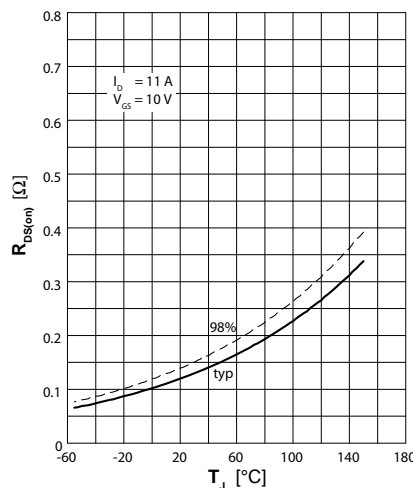


Fig. 5 Drain-Source On-State Resistance

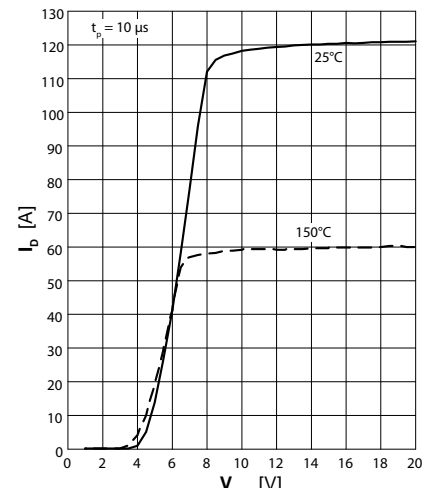


Fig. 6 Typ. Transfer Characteristics

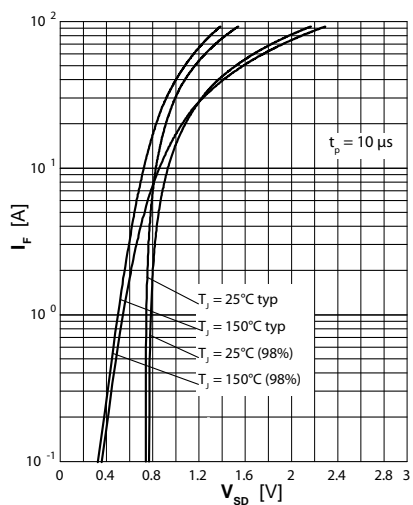


Fig. 7 Forward Characteristics of Body Diode

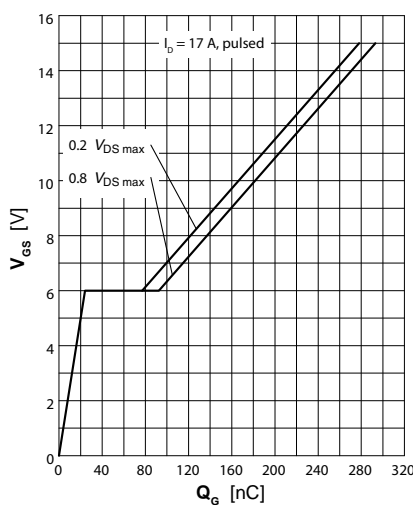


Fig. 8 Typ. Gate Charge

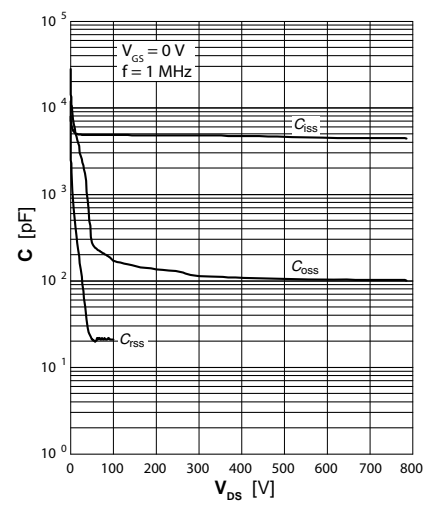


Fig. 9 Capacitance

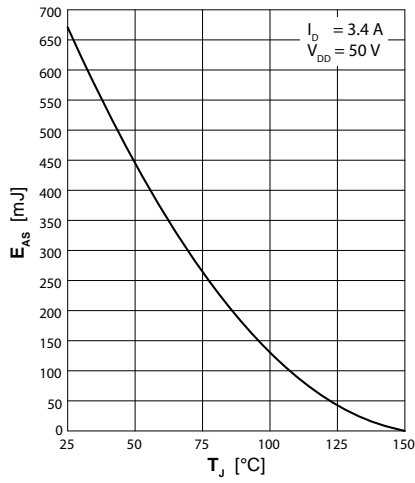


Fig. 10 Typ. Avalanche Energy

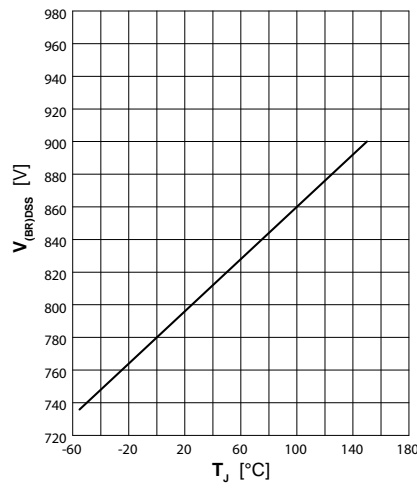


Fig. 11 Drain-Source Breakdown Voltage

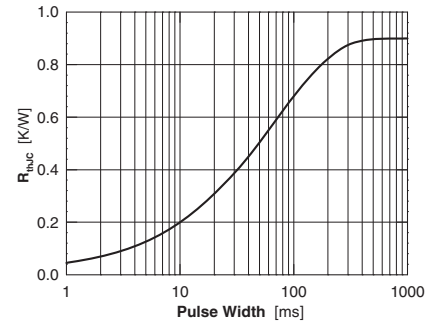


Fig. 12 Maximum Transient Thermal Resistance



---

Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).