

CoolMOS™ 1) Power MOSFET

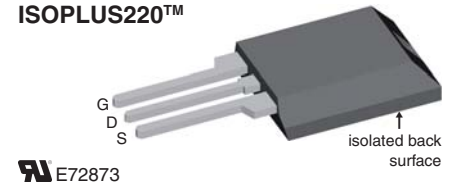
Electrically isolated back surface
 2500 V electrical isolation
 N-Channel Enhancement Mode
 Low $R_{DS(on)}$, high V_{DSS} MOSFET
 Ultra low gate charge



$$I_{D25} = 15 \text{ A}$$

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

$$R_{DS(on) \text{ max}} = 0.165 \Omega$$

ISOPLUS220™


MOSFET			
Symbol	Conditions	Maximum Ratings	
V_{DSS}	$T_{VJ} = 25^\circ\text{C}$	600	V
V_{GS}		± 20	V
I_{D25}	$T_C = 25^\circ\text{C}$	15	A
I_{D90}	$T_C = 90^\circ\text{C}$	11	A
E_{AS} E_{AR}	single pulse repetitive } $I_D = 7.9 \text{ A}; T_C = 25^\circ\text{C}$	522 0.79	mJ 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

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	mΩ
$V_{GS(th)}$	$V_{DS} = V_{GS}; I_D = 0.9 \text{ mA}$	2.5	3	3.5	V
I_{DSS}	$V_{DS} = 600 \text{ V}; V_{GS} = 0 \text{ V}$			1	μA μA
			tbd		
I_{GSS}	$V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$			100	nA
C_{iss} C_{oss}	$V_{GS} = 0 \text{ V}; V_{DS} = 100 \text{ V}$ $f = 1 \text{ MHz}$		2000 100		pF pF
Q_g Q_{gs} Q_{gd}	$V_{GS} = 0 \text{ to } 10 \text{ V}; V_{DS} = 400 \text{ V}; I_D = 12 \text{ A}$		40 9 13	52	nC nC nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	$V_{GS} = 10 \text{ V}; V_{DS} = 400 \text{ V}$ $I_D = 12 \text{ A}; R_G = 3.3 \Omega$		tbd tbd tbd tbd		ns ns ns ns
R_{thJC}				1.1	K/W

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.

Source-Drain Diode

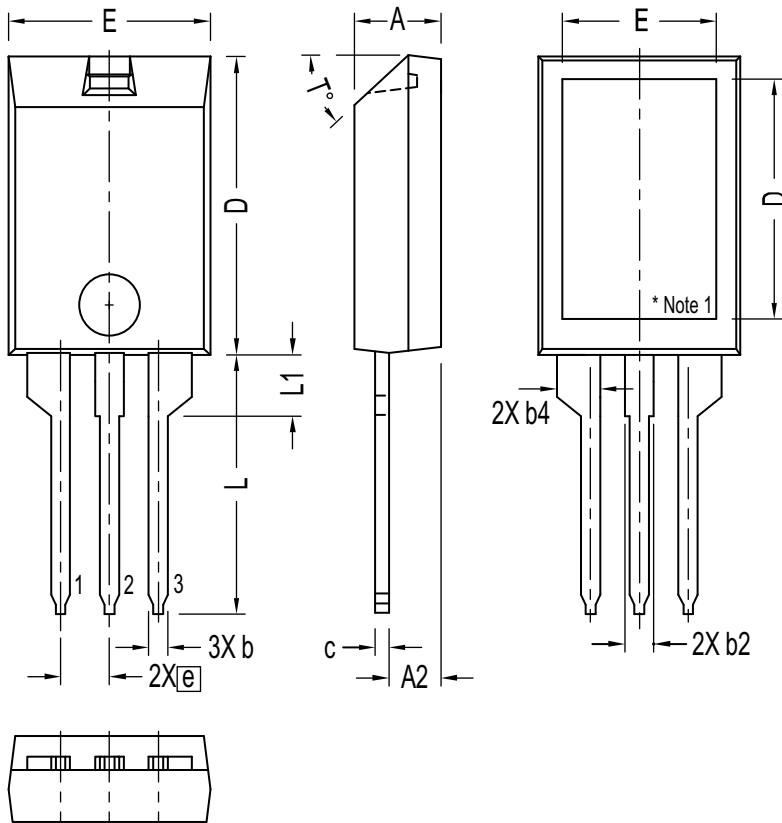
Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
(T _{VJ} = 25°C, unless otherwise specified)				
I _S	V _{GS} = 0 V		12	A
V _{SD}	I _F = 12 A; V _{GS} = 0 V	0.9	1.2	V
t _{rr}	I _F = 12 A; -di _F /dt = 100 A/μs; V _R = 400 V	390		ns
Q _{RM}		7.5		μC
I _{RM}		38		A

Component

Symbol	Conditions	Maximum Ratings		
		min.	typ.	max.
T _{VJ}	operating	-55...+150		°C
T _{stg}	storage	-55...+150		°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	0.35		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.

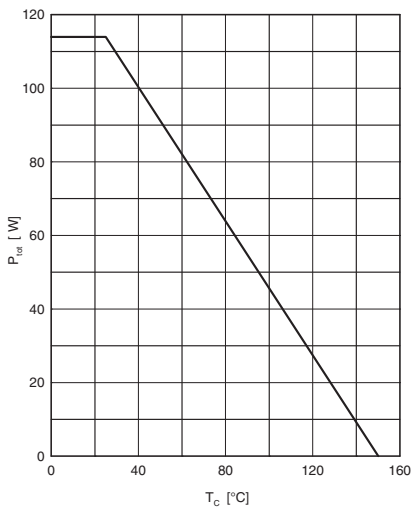


Fig. 1 Power dissipation

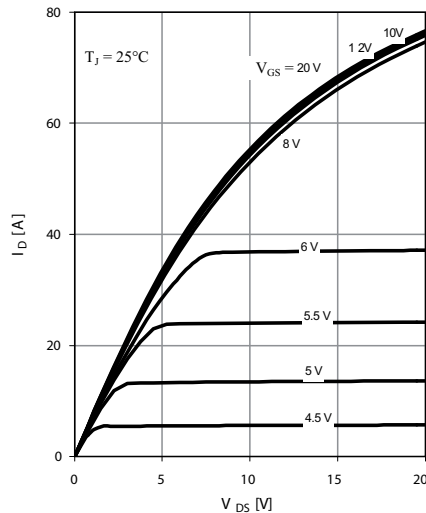


Fig. 2 Typ. output characteristics

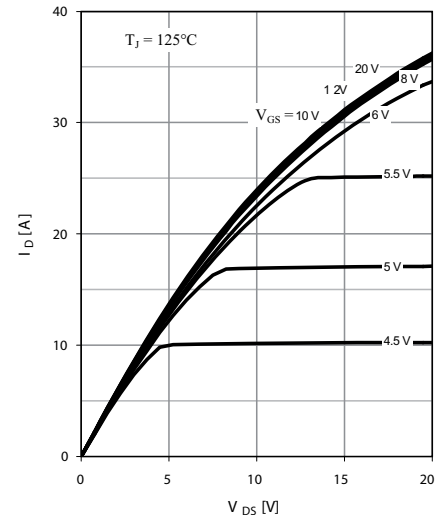


Fig. 3 Typ. output characteristics

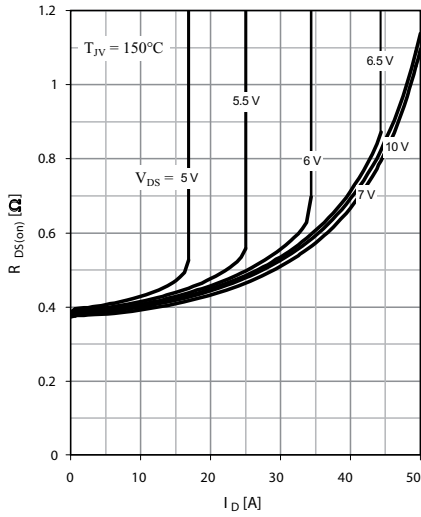


Fig. 4 Typ. drain-source on-state resistance

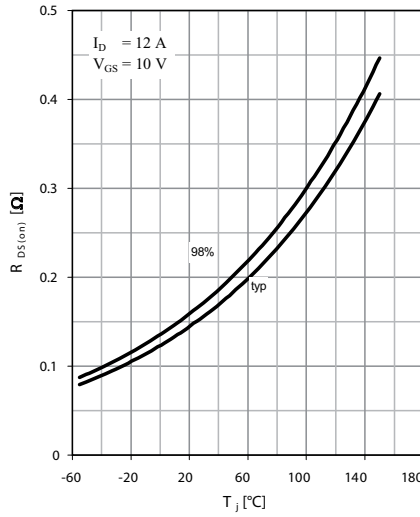


Fig. 5 Drain-source on-state resistance

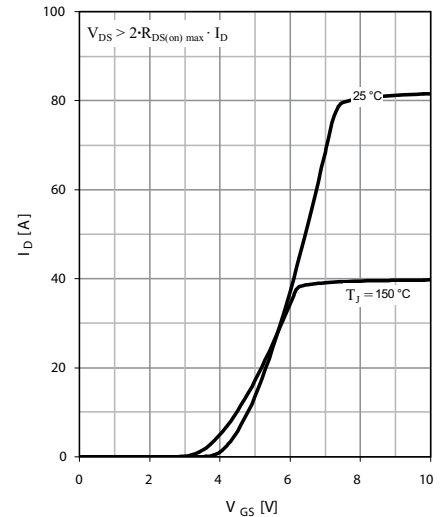


Fig. 6 Typ. transfer characteristics

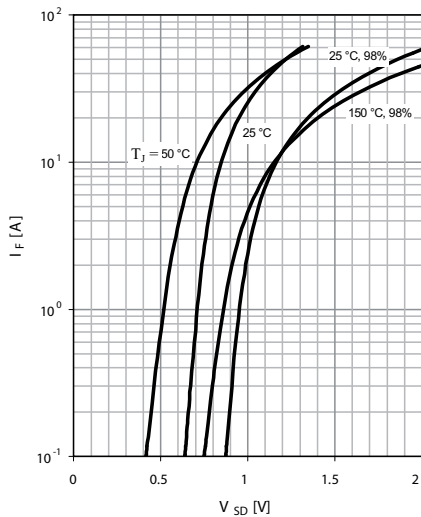


Fig. 7 Forward characteristic of reverse diode

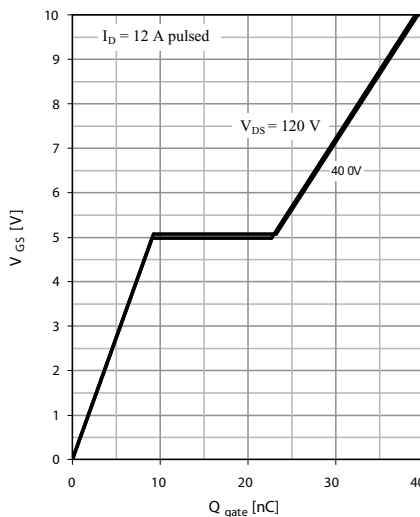


Fig. 8 Typ. gate charge

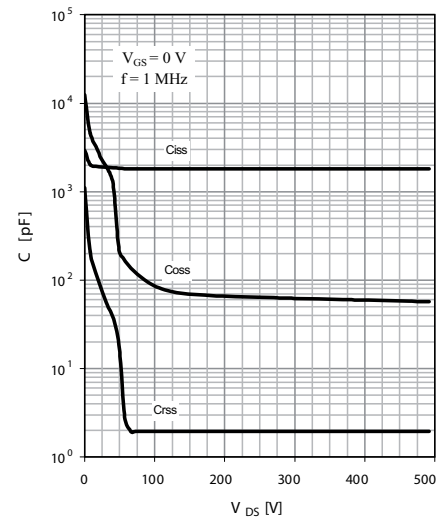


Fig. 9 Typ. capacitances

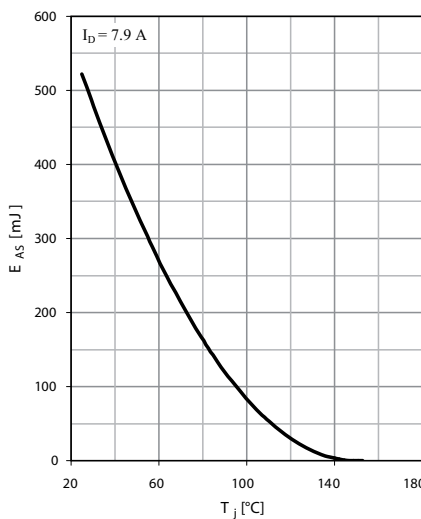


Fig. 10 Avalanche energy

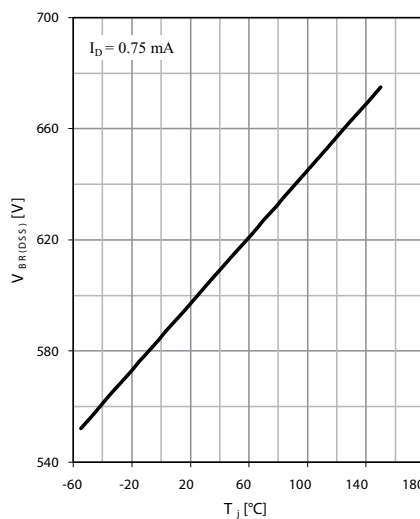


Fig. 11 Drain-source breakdown voltage

IXYS reserves the right to change limits, test conditions and dimensions.

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