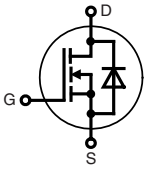
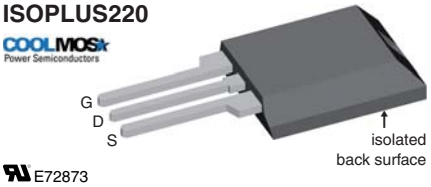
CoolMOS™ [1] Power MOSFET ISOPLUS™ Package

N-Channel Enhancement Mode
Low R_{DSon}, high V_{DSS} MOSFET
Electrically Isolated Back Surface

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



ISOPLUS220



E72873

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

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

Features

- Silicon chip on Direct-Copper-Bond substrate
  - high power dissipation
  - isolated mounting surface
  - 2500 V electrical isolation
- 3rd 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

[1] CoolMOS™ is a trademark of Infineon Technologies AG.

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Source-Drain Diode

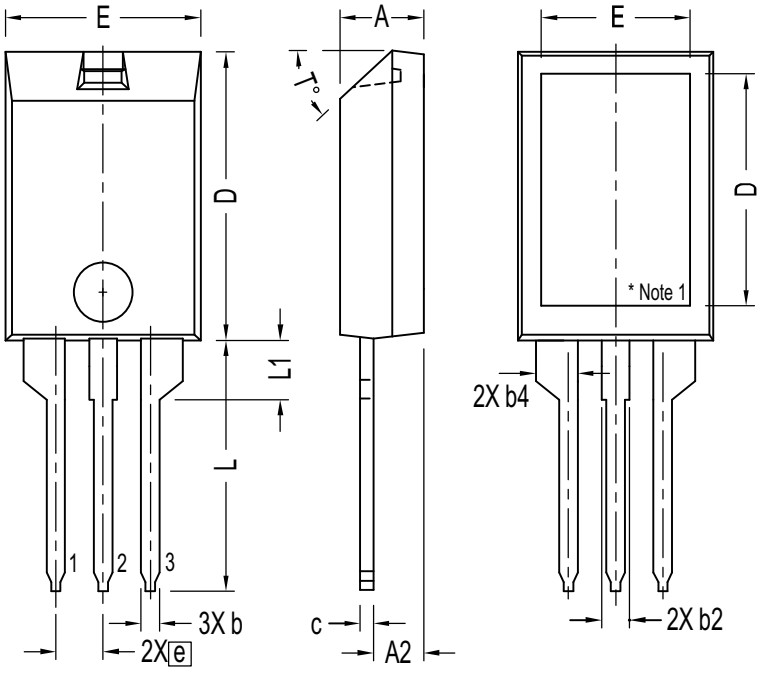
Symbol	Conditions	Characteristic Values (T_{VJ} = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0 V			34	A
V_{SD}	I_F = 35 A; V_{GS} = 0 V		1.0	1.2	V
t_{rr}	I_F = 35 A; -di_F/dt = 200 A/µs; V_R = 400 V		550		ns
Q_{RM}			30		µC
I_{RM}			100		A

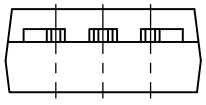
Component

Symbol	Conditions	Maximum Ratings	
T_{VJ}	operating	-55...+150	°C
T_{stg}		-55...+150	°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 MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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.

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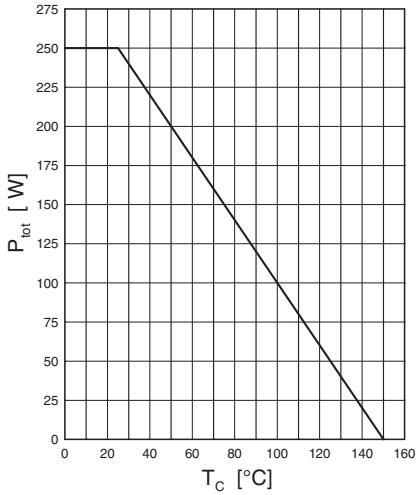

Fig. 1 Power Dissipation

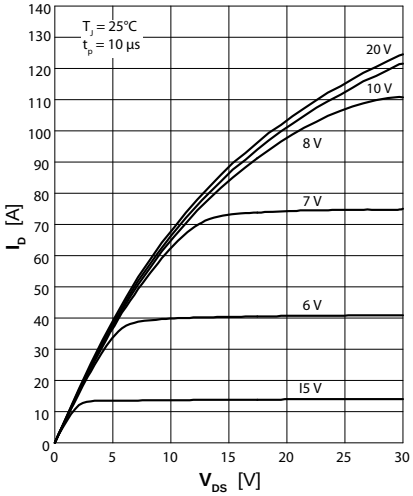

Fig. 2 Typ. Output Characteris-

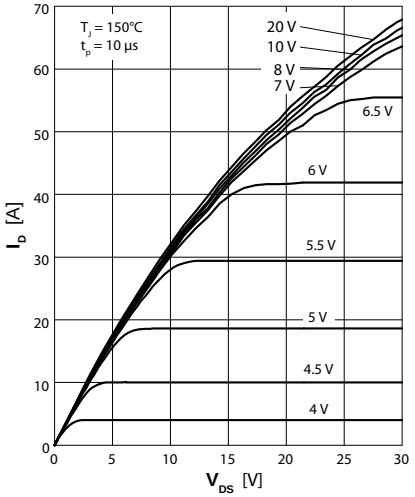

Fig. 3 Typ. Output Characteris-

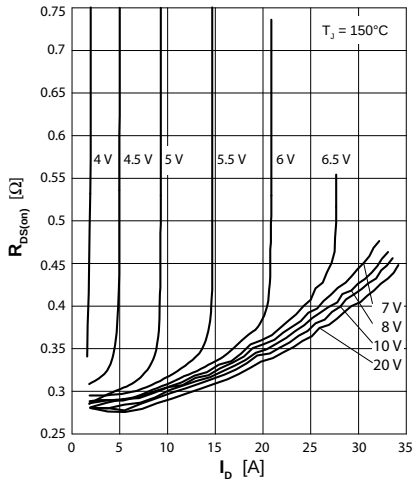

Fig. 4 Typ. Drain-Source on Resistance

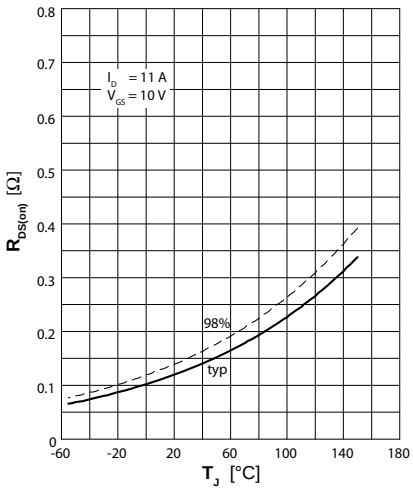

Fig. 5 Drain-Source On-State Resistance

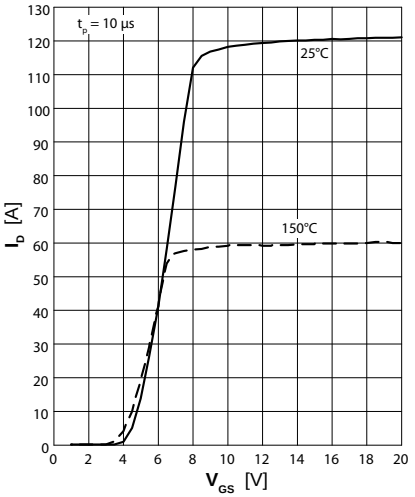

Fig. 6 Typ. Transfer Characteris-

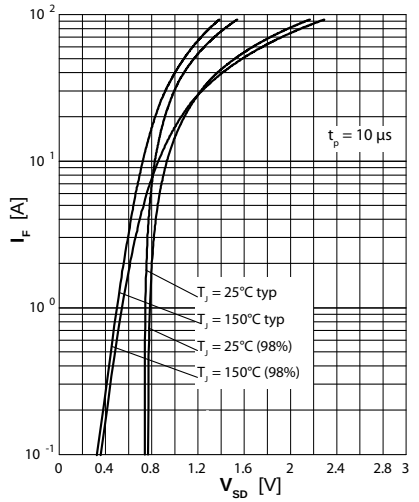

Fig. 7 Forward Characteristics of Body Diode

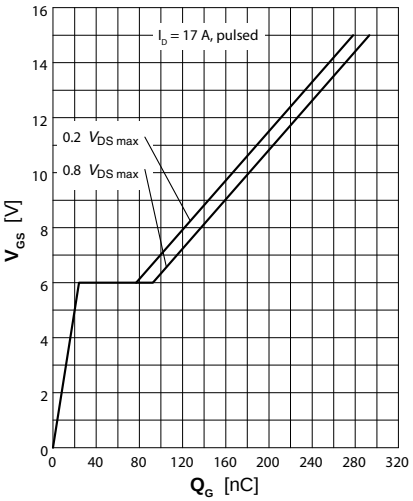

Fig. 8 Typ. Gate Charge

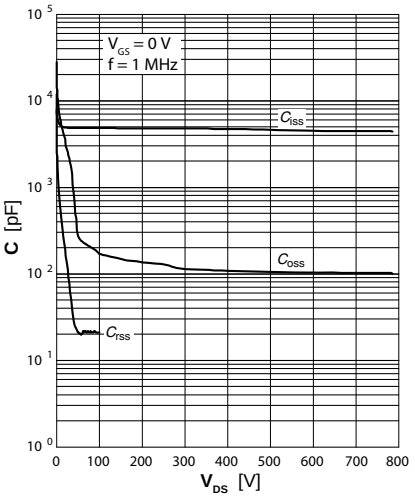

Fig. 9 Capacitance

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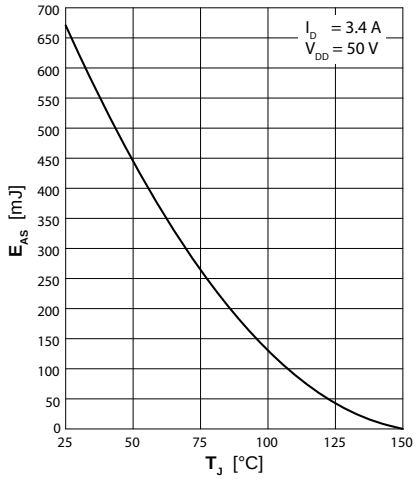

Fig. 10 Typ. Avalanche Energy

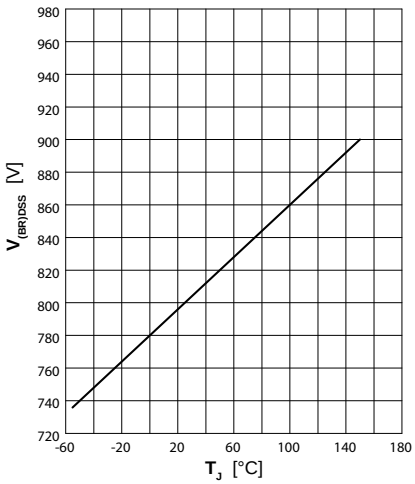

Fig. 11 Drain-Source Breakdown Voltage

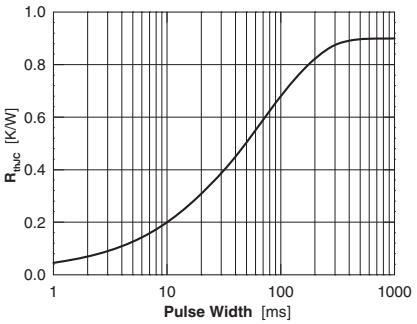

Fig. 12 Maximum Transient Thermal Resistance

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