IXYS

ADVANCE TECHNICAL INFORMATION

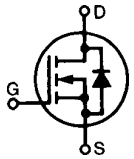
CoolMOS Power MOSFET ISOPLUS220™

Electrically Isolated Back Surface

N-Channel Enhancement Mode
Low $R_{DS(on)}$, High Voltage, MOSFET

IXKC 40N60C

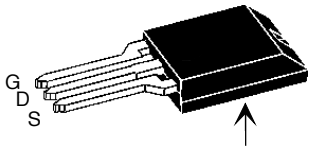
V_{DSS} = 600 V
I_{D25} = 28 A
$R_{DS(on)}$ = 96 mΩ



COOLMOS™
Power Semiconductors

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	600	V
V_{GS}	Continuous	±20	V
I_{D25}	T_C = 25°C; Note 1	28	A
I_{D90}	T_C = 90°C, Note 1	19	A
$I_{D(RMS)}$	Package lead current limit	45	A
E_{AS}	I_o = 10A, T_C = 25°C	690	mJ
E_{AR}	I_o = 20A	1	mJ
P_D	T_C = 25°C	250	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +125	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
V_{ISOL}	RMS leads-to-tab, 50/60 Hz, t = 1 minute	2500	V~
F_C	Mounting force	11 ... 65 / 2.4 ...11	N/lb
Weight		3	g

ISOPLUS 220™



Isolated back surface*

G = Gate, D = Drain,
S = Source

* Patent pending

Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- 2ND generation CoolMOS power MOSFET
  - High blocking capability
  - Low on resistance
  - Avalanche rated for unclamped inductive switching (UIS)
- Low thermal resistance due to reduced chip thickness
- Low drain to tab capacitance(<30pF)

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

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
$R_{DS(on)}$	V_{GS} = 10 V, I_D = I_{D90}, Note 3		80	96	mΩ
	V_{GS} = 10 V, I_D = I_{D90}, Note 3 T_J = 125°C		230		mΩ
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 2 mA	3.5		5.5	V
I_{DSS}	V_{DS} = V_{DSS} T_J = 25°C			2	µA
	V_{GS} = 0 V T_J = 125°C		20		µA
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0			±200	nA

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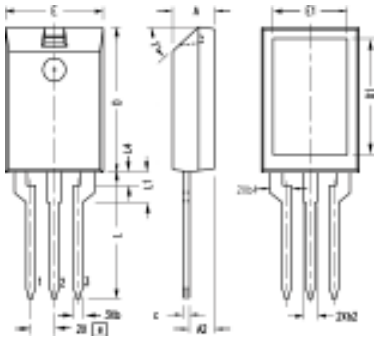
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values min.	typ.	max.	
$Q_{g(on)}$			158		nC
Q_{gs}	V_{GS} = 10 V, V_{DS} = 350 V, I_D = 40 A		42		nC
Q_{gd}			92		nC
$t_{d(on)}$			20		ns
t_r	V_{GS} = 10 V, V_{DS} = 380V		55		ns
$t_{d(off)}$	I_D = 40 A, R_G = 1.8 Ω		60		ns
t_f			10		ns
R_{thJC}				0.5	K/W
R_{thCH}			0.30		K/W

Reverse Correction

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values min.	typ.	max.	
V_{SD}	I_F = 20 A, V_{GS} = 0 V Note 3		0.8	1.2	V

Note: 1. MOSFET chip capability
2. Intrinsic diode capability
3. Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %

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
L4	.039	.059	1.00	1.50
T*			42.5°	47.5°

Note: All terminals are solder plated.
1 - Gate
2 - Drain
3 - Source