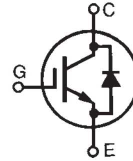
IXYS

HiPerFAST™ IGBT with Diode ISOPLUS247™

IXGR 24N60CD1

(Electrically Isolated Back Surface)

V_{CES}	=	600	V
I_{C25}	=	42	A
$V_{CE(sat)}$	=	2.5	V



Preliminary data sheet

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	600	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	600	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	42	A
I_{C90}	T_C = 90°C	22	A
I_{CM}	T_C = 25°C, 1 ms	80	A
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 125°C, R_G = 22 Ω Clamped inductive load, L = 100 ∝H	I_{CM} = 48 @ 0.8 V_{CES}	A
P_C	T_C = 25°C	80	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
V_{ISOL}		2500	V
Weight	TO-247	6	g

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
BV_{CES}	I_C = 750 ∝A, V_{GE} = 0 V		600			V
$V_{GE(th)}$	I_C = 250 ∝A, V_{CE} = V_{GE}		2.5		5.5	V
I_{CES}	V_{CE} = 0.8 • V_{CES} V_{GE} = 0 V	T_J = 25°C T_J = 125°C			200 3	∝A mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = I_T, V_{GE} = 15 V			2.1	2.5	V

ISOPLUS 247

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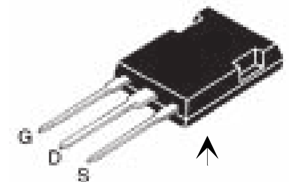

Isolated back surface*

G = Gate, C = Collector
E = Emitter

* Patent pending

Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance(<35pF)
- Low $R_{DS\ (on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic rectifier
- Low gate charge process

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control

Advantages

- Easy assembly
- Space savings
- High power density

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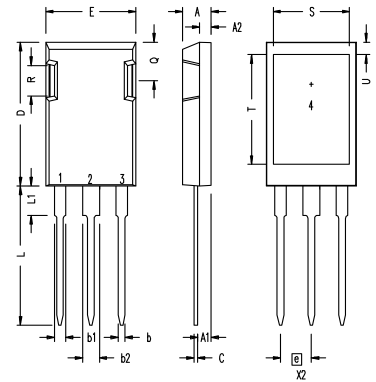
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	I_C = I_T; V_{CE} = 10 V, Pulse test, t ≤ 300 ∝s, duty cycle ≤ 2 %	9	17		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		1500		pF
C_{oes}			170		pF
C_{res}			40		pF
Q_g	I_C = I_T, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		55		nC
Q_{ge}			13		nC
Q_{gc}			17		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		15		ns
t_{ri}	I_C = I_T, V_{GE} = 15 V, L = 300 ∝H		25		ns
$t_{d(off)}$	V_{CE} = 0.8 • V_{CES}, R_G = R_{off} = 18 Ω		75	140	ns
t_{fi}	Remarks: Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or		60	110	ns
E_{off}	increased R_G		0.24	0.36	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		15		ns
t_{ri}	I_C = I_T, V_{GE} = 15 V, L = 300 ∝H		25		ns
E_{on}	V_{CE} = 0.8 • V_{CES}, R_G = R_{off} = 18 Ω		1		mJ
$t_{d(off)}$	Remarks: Switching times may increase		130		ns
t_{fi}	for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or		110		ns
E_{off}	increased R_G		0.6		mJ
R_{thJC}				0.157	K/W
R_{thCK}			0.15		K/W

ISOPLUS 247 OUTLINE



1 Gate, 2 Drain (Collector)
3 Source (Emitter)
4 no connection

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.83	5.21	.190	.205
A_1	2.29	2.54	.090	.100
A_2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b_1	1.91	2.13	.075	.084
b_2	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190

Reverse Diode (FRED)

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_F	I_F = I_T, V_{GE} = 0 V, T_J = 150°C			1.6	V
	Pulse test, t ≤ 300 ∝s, duty cycle d ≤ 2 % T_J = 25°C			2.5	V
I_{RM}	I_F = I_T, V_{GE} = 0 V, -di_F/dt = 100 A/∝s		6		A
t_{rr}	V_R = 100 V T_J = 100°C		100		ns
	I_F = 1 A; -di/dt = 100 A/∝s; V_R = 30 V T_J = 25°C		25		ns
R_{thJC}				1.65	K/W

Notes: 1. I_T = 24A
2. See IXGH24N60CD1 data sheet for characteristic curves.

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

IXYS MOSFETS and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025