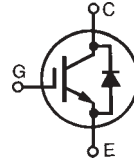


HiPerFAST™ IGBT IXGR 24N60CD1 with Diode ISOPLUS247™ (Electrically Isolated Back Surface)

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

$$I_{C25} = 42 \text{ A}$$

$$V_{CE(sat)} = 2.5 \text{ V}$$

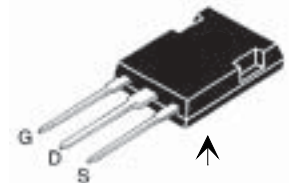


Preliminary data sheet

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

ISOPLUS 247

E153432



G = Gate,
E = Emitter

C = Collector

* 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

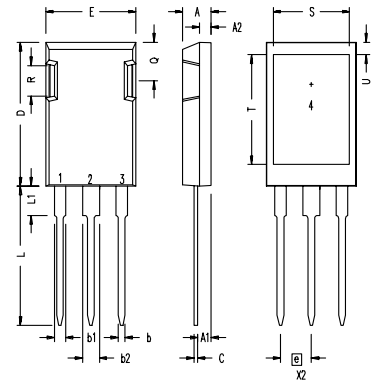
- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control

Advantages

- Easy assembly
- Space savings
- High power density

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

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 μs, 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 I _C = I _T , V _{GE} = 15 V, L = 300 μH V _{CE} = 0.8 • V _{CES} , R _G = R _{off} = 18 Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8 • V _{CES} , higher T _J or increased R _G		15	ns	
t_{ri}			25	ns	
t_{d(off)}			75	140	ns
t_{fi}			60	110	ns
E_{off}			0.24	0.36	mJ
t_{d(on)}	Inductive load, T_J = 125°C I _C = I _T , V _{GE} = 15 V, L = 300 μH V _{CE} = 0.8 • V _{CES} , R _G = R _{off} = 18 Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8 • V _{CES} , higher T _J or increased R _G		15	ns	
t_{ri}			25	ns	
E_{on}			1	mJ	
t_{d(off)}			130	ns	
t_{fi}			110	ns	
E_{off}			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		Inches	
	Min.	Max.	Min.	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)
Characteristic Values

 (T_J = 25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values		
		min.	typ.	max.
V_F	I _F = I _T , V _{GE} = 0 V, T _J = 150°C Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 % T _J = 25°C			1.6 V 2.5 V
I_{RM}	I _F = I _T , V _{GE} = 0 V, -di _F /dt = 100 A/μs V _R = 100 V I _F = 1 A; -di _F /dt = 100 A/μs; V _R = 30 V		6	A
t_{rr}			100	ns
			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