

HiPerFAST™ IGBT

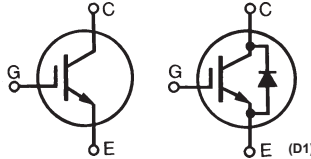
ISOPLUS247™

(Electrically Isolated Backside)

IXGR 39N60B
IXGR 39N60BD1

$$\begin{aligned} V_{CES} &= 600 \text{ V} \\ I_{C25} &= 66 \text{ A} \\ V_{CE(sat)} &= 1.8 \text{ V} \\ t_{fi(typ)} &= 200 \text{ ns} \end{aligned}$$

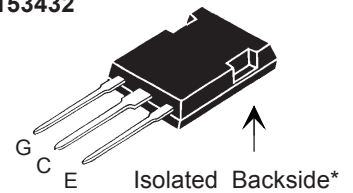
Preliminary data sheet



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}	$T_C = 25^\circ\text{C}$	66	A
I_{C110}	$T_C = 110^\circ\text{C}$	35	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1 ms	152	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 10 \Omega$ Clamped inductive load, $L = 100 \mu\text{H}$	$I_{CM} = 76$ @ $0.8 V_{CES}$	A
P_c	$T_C = 25^\circ\text{C}$	140	W
V_{ISOL}	50/60 Hz RMS $t = 1$ minute	2500	V
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	$^\circ\text{C}$
Weight		5	g

ISOPLUS 247

 E153432



G = Gate, C = Collector
E = Emitter

* Patent pending

Features

- DCB Isolated mounting tab
- Meets TO-247AD package Outline
- High current handling capability
- Latest generation HDMOS™ process
- MOS Gate turn-on - drive simplicity

Applications

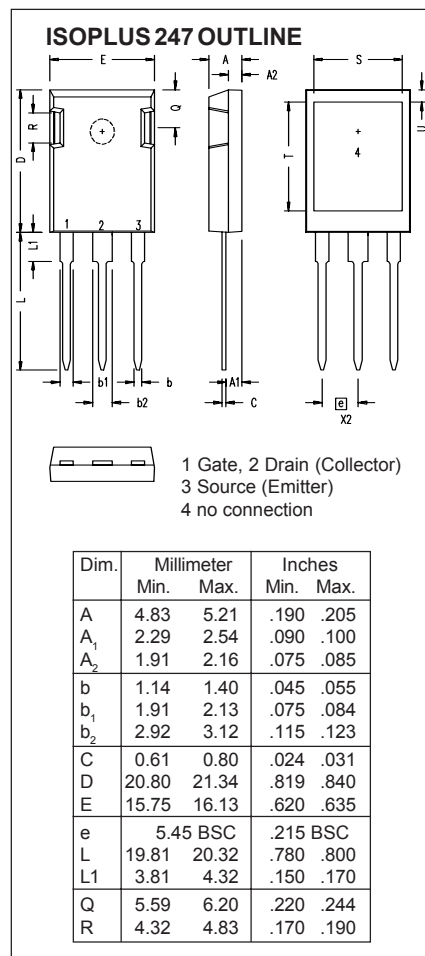
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

Advantages

- Easy assembly
- High power density
- Very fast switching speeds for high frequency applications

Symbol	Test Conditions		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
			Min.	Typ.	Max.
BV_{CES}	$I_C = 250 \mu\text{A}$, $V_{GE} = 0 \text{ V}$ $I_C = 750 \mu\text{A}$	39N60B 39N60BD1	600 600		V
$V_{GE(th)}$	$I_C = 250 \mu\text{A}$, $V_{CE} = V_{GE}$ $I_C = 500 \mu\text{A}$	39N60B 39N60BD1	2.5 2.5		5.0 V 5.0 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$, $T_J = 25^\circ\text{C}$ $V_{GE} = 0 \text{ V}$; note 1 $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ $T_J = 125^\circ\text{C}$	39N60B 39N60BD1 39N60B 39N60BD1			200 μA 650 μA 1 mA 3 mA
I_{GES}	$V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$				$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = I_T$, $V_{GE} = 15 \text{ V}$				1.8 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 %	19		S	
C_{ies}	C_{oes} C_{res} $\left. \begin{array}{l} \\ \\ \end{array} \right\} V_{CE} = 25 \text{ V}, V_{GE} = 0 \text{ V}, f = 1 \text{ MHz}$	39N60B	2750	pF	
		39N60BD1	200	pF	
			250	pF	
			50	pF	
Q_g	$\left. \begin{array}{l} \\ \\ \end{array} \right\} I_C = I_T, V_{GE} = 15 \text{ V}, V_{CE} = 0.5 V_{CES}$		125	nC	
Q_{ge}			25	nC	
Q_{gc}			40	nC	
t_{d(on)}	Inductive load, T_J = 25°C I_C = I_T, V_{GE} = 15 V V_{CE} = 0.8 • V_{CES}, R_G = R_{off} = 4.7 Ω Remarks: Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G		25	ns	
t_{ri}			30	ns	
t_{d(off)}			250	500	ns
t_{fi}			200	360	ns
E_{off}			4.0	6.0	mJ
t_{d(on)}	Inductive load, T_J = 125°C I_C = I_T, V_{GE} = 15 V V_{CE} = 0.8 • V_{CES}, R_G = R_{off} = 4.7 Ω Remarks: Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G	39N60B	25	ns	
t_{ri}		39N60BD1	30	ns	
E_{on}			0.3	mJ	
t_{d(off)}			1.0	mJ	
t_{fi}			360	ns	
			350	ns	
E_{off}			6.0	mJ	
R_{thJC}			0.9	K/W	
R_{thCK}		0.15		K/W	



Please see IXGH 39N60B data sheet for characteristic curves.

Reverse Diode (FRED) (IXGR39N60BD1 only)		Characteristic Values	
(T _J = 25°C, unless otherwise specified)		min.	max.
Symbol	Test Conditions	typ.	
V _F	I _F = 30A, V _{GE} = 0 V, T _J = 150°C Note 1		1.6 V 2.5 V
I _{RM}	I _F = 50A, V _{GE} = 0 V, V _R = 100 V T _J = 100°C -di _F /dt = 100 A/μs	2.5 175	A ns
t _{rr}	I _F = 1 A; -di/dt = 100 A/μs; V _R = 30 V	25	ns
R _{thJC}			1.1 K/W

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	6,306,728B1	6,259,123B1	6,306,728B1	
4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	6,404,065B1	6,162,665	6,534,343	6,583,505