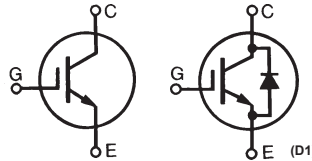


# HiPerFAST™ IGBT ISOPLUS247™ (Electrically Isolated Backside)

IXGR 39N60B  
IXGR 39N60BD1

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

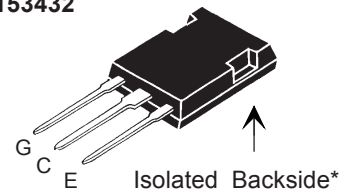
Preliminary data sheet



Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
$V_{CGR}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	600	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$	66	A
$I_{C110}$	$T_C = 110^\circ\text{C}$	35	A
$I_{CM}$	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	152	A
<b>SSOA (RBSOA)</b>	$V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 10 \Omega$ 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 $t = 1 \text{ minute}$	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	$^\circ\text{C}$
<b>Weight</b>		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

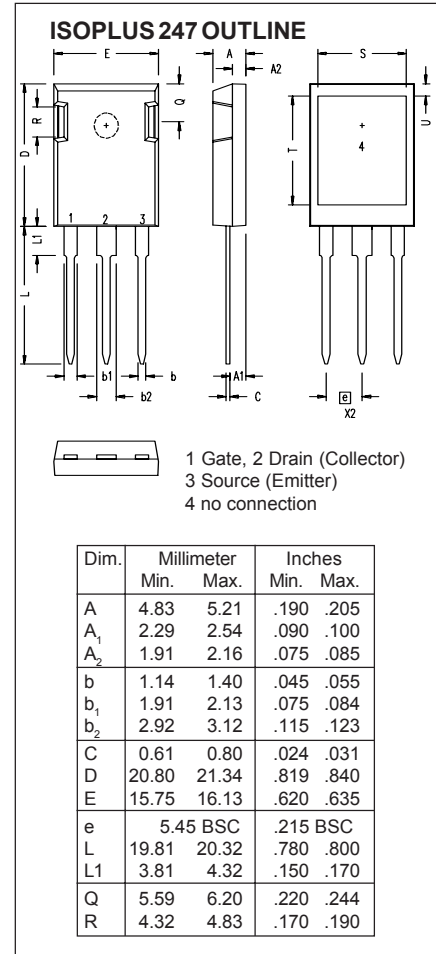
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

## 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.
$BV_{CES}$	$I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$	39N60B	600	V
	$I_C = 750 \mu\text{A}$	39N60BD1	600	
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	39N60B	2.5	5.0 V
	$I_C = 500 \mu\text{A}$	39N60BD1	2.5	5.0 V
$I_{CES}$	$V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 \text{ V}; \text{ note } 1$	$T_J = 25^\circ\text{C}$	39N60B	200 $\mu\text{A}$
		$T_J = 25^\circ\text{C}$	39N60BD1	650 $\mu\text{A}$
		$T_J = 125^\circ\text{C}$	39N60B	1 mA
		$T_J = 125^\circ\text{C}$	39N60BD1	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 ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)			
		min.	typ.	max.	
$g_{fs}$	$I_C = I_T; V_{CE} = 10\text{ V}$ , Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $\leq 2\%$	19		S	
$C_{ies}$	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$		2750	pF	
$C_{oes}$		39N60B	200	pF	
$C_{res}$		39N60BD1	250	pF	
$Q_g$	$I_C = I_T, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$		125	nC	
$Q_{ge}$			25	nC	
$Q_{gc}$			40	nC	
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b> $I_C = I_T, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 \cdot V_{CES}, R_G = R_{off} = 4.7\ \Omega$ Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$ , 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
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = I_T, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 \cdot V_{CES}, R_G = R_{off} = 4.7\ \Omega$ Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$ , higher $T_J$ or increased $R_G$		25	ns	
$t_{ri}$			30	ns	
$E_{on}$		39N60B	0.3	mJ	
$t_{d(off)}$		39N60BD1	1.0	mJ	
$t_{fi}$			360	ns	
$E_{off}$		350	ns		
		6.0	mJ		
$R_{thJC}$			0.9	K/W	
$R_{thCK}$		0.15		K/W	



Please see IXGH 39N60B data sheet for characteristic curves.

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_F$	$I_F = 30\text{ A}, V_{GE} = 0\text{ V}$ , Note 1	$T_J = 150^\circ\text{C}$	1.6	V
			2.5	V
$I_{RM}$	$I_F = 50\text{ A}, V_{GE} = 0\text{ V}, V_R = 100\text{ V}$ $-di_F/dt = 100\text{ A}/\mu\text{s}$	$T_J = 100^\circ\text{C}$	2.5	A
			175	ns
$t_{rr}$	$I_F = 1\text{ A}; -di/dt = 100\text{ A}/\mu\text{s}; V_R = 30\text{ V}$		25	ns
$R_{thJC}$			1.1	K/W

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