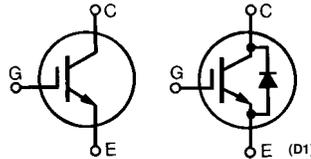


# HiPerFAST™ IGBT ISOPLUS247™ (Electrically Isolated Backside)

**IXGR 40N60B**  
**IXGR 40N60BD1**

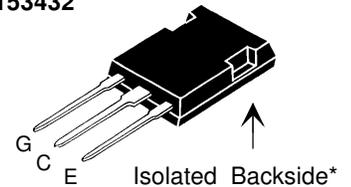
$V_{CES} = 600 \text{ V}$   
 $I_{C25} = 70 \text{ A}$   
 $V_{CE(sat)} = 2.1 \text{ V}$   
 $t_{fi(typ)} = 180 \text{ ns}$



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
$I_{C25}$	$T_C = 25^\circ\text{C}$	70	A
$I_{C90}$	$T_C = 90^\circ\text{C}$	35	A
$I_{CM}$	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	150	A
<b>SSOA (RBSOA)</b>	$V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 10 \Omega$ Clamped inductive load, $L = 100 \mu\text{H}$	$I_{CM} = 80$ @ $0.8 V_{CES}$	A
$P_C$	$T_C = 25^\circ\text{C}$	200	W
$T_J$		-40 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-40 ... +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
- Low collector-to-drain capacitance (<35pF)

## Applications

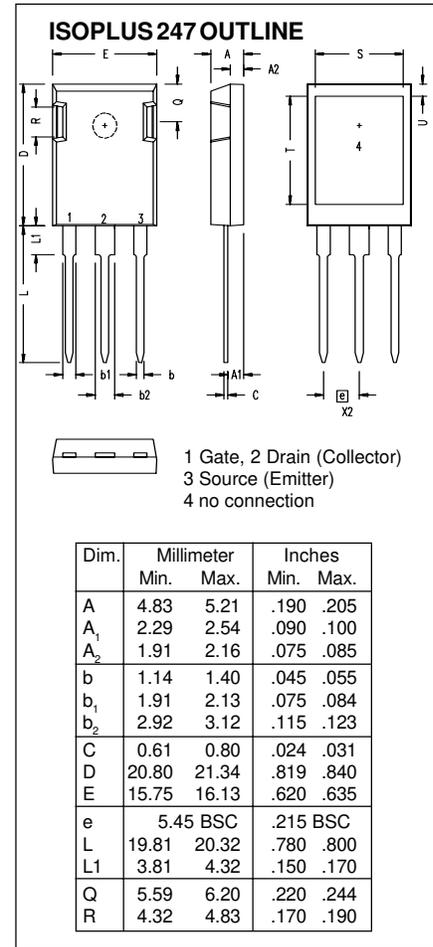
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

## Advantages

- Easy assembly
- High power density

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		Min.	Typ.	Max.
$BV_{CES}$	$I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$	40N60B	600	V
	$I_C = 750 \mu\text{A}$	40N60BD1	600	
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	40N60B	2.5	5.0 V
	$I_C = 500 \mu\text{A}$	40N60BD1	2.5	5.0 V
$I_{CES}$	$V_{CE} = 0.8 V_{CES}, T_J = 25^\circ\text{C}$ $V_{GE} = 0 \text{ V}; \text{note } 1, T_J = 25^\circ\text{C}$	40N60B		200 $\mu\text{A}$
		40N60BD1		650 $\mu\text{A}$
	$T_J = 125^\circ\text{C}$	40N60B		1 mA
		40N60BD1		3 mA
$I_{GES}$	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = I_T, V_{GE} = 15 \text{ V}$		1.6	2.1 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 $\leq 2\%$	30	42	S	
$C_{ies}$	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$		3300	pF	
$C_{oes}$		40N60B	310	pF	
$C_{res}$		40N60BD1	370	pF	
$Q_g$	$I_C = I_T, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$		116	nC	
$Q_{ge}$			23	nC	
$Q_{gc}$			55	nC	
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b> $I_C = I_T, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 4.7\ \Omega$ 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	
$t_{d(off)}$			180	300	ns
$t_{fi}$			180	270	ns
$E_{off}$			2.7	4.0	mJ
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = I_T, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 4.7\ \Omega$ 40N60B 40N60BD1 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	
$E_{on}$			0.4	mJ	
$t_{d(off)}$			1.2	mJ	
$t_{fi}$			300	ns	
$E_{off}$			270	ns	
$R_{thJC}$			0.6	K/W	
$R_{thCK}$		0.15		K/W	



Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_F$	$I_F = I_T, V_{GE} = 0\text{ V}$ , Note 1			$T_J = 150^\circ\text{C}$
			1.3	V
			1.8	V
$I_{RM}$	$I_F = I_T, V_{GE} = 0\text{ V}, V_R = 100\text{ V}, T_J = 100^\circ\text{C}, -di/dt = 100\text{ A}/\mu\text{s}$		7.5	A
$t_{rr}$	$I_F = 1\text{ A}; -di/dt = 100\text{ A}/\mu\text{s}; V_R = 30\text{ V}$		35	ns
$R_{thJC}$			0.90	K/W

Note: 1. Pulse test,  $t_p \leq 300\text{ ms}$ , duty cycle:  $d \leq 2\%$   
2.  $I_T = 40\text{ A}$

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