

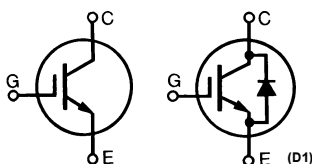
HiPerFAST™ IGBT

ISOPLUS247™

(Electrically Isolated Backside)

IXGR 40N60B
IXGR 40N60BD1

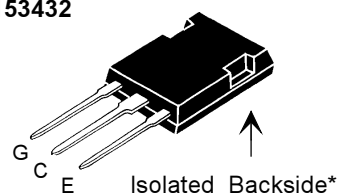
$$\begin{aligned} V_{CES} &= 600 \text{ V} \\ I_{C25} &= 70 \text{ A} \\ V_{CE(sat)} &= 2.1 \text{ V} \\ t_{fi(typ)} &= 180 \text{ ns} \end{aligned}$$



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	± 20	V
V_{GEM}	Transient	± 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
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 10 \Omega$ Clamped inductive load, $L = 100 \mu\text{H}$	$I_{CM} = 80$ @ $0.8 V_{CES}$	A
P_c	$T_C = 25^\circ\text{C}$	200	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	$^\circ\text{C}$
M_d	Mounting torque (M3)	1.13/10Nm/lb.in.	
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

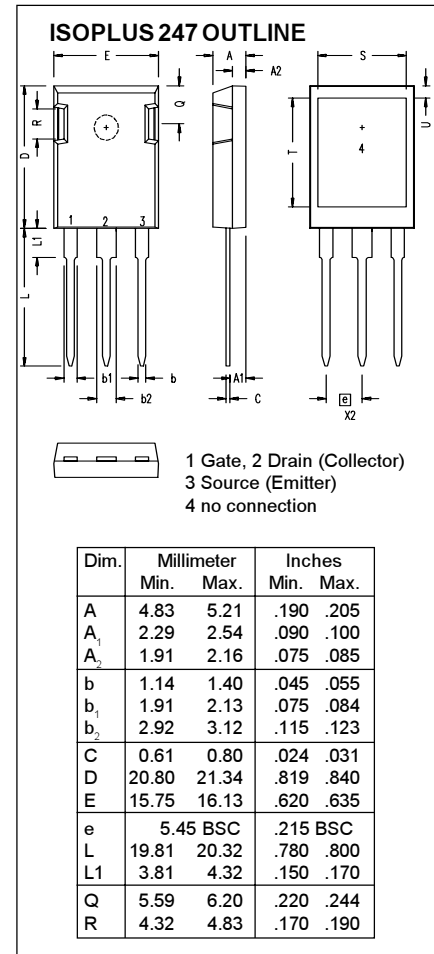
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

Advantages

- Easy assembly
- High power density

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}	$V_{CE} = 0.8 \cdot V_{CES}, T_J = 25^\circ\text{C}$	40N60B		200 μA
	$V_{GE} = 0 \text{ V}; \text{note 1 } T_J = 25^\circ\text{C}$	40N60BD1		650 μA
	$T_J = 125^\circ\text{C}$	40N60B		1 mA
	$T_J = 125^\circ\text{C}$	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, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$	30	42	S
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$	3300 310 370 65	40N60B 40N60BD1	pF
C_{oes}				pF
C_{res}				pF
Q_g	$I_C = I_T$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$	116 23 55		nC
Q_{ge}				nC
Q_{gc}				nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_T$, $V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 \cdot V_{CES}$, $R_G = R_{off} = 4.7\text{ }\Omega$ 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
$t_{d(off)}$		180	300	ns
t_{fi}		180	270	ns
E_{off}		2.7	4.0	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_T$, $V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 \cdot V_{CES}$, $R_G = R_{off} = 4.7\text{ }\Omega$ 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}		0.4		mJ
$t_{d(off)}$		1.2		mJ
t_{fi}		300		ns
		270		ns
E_{off}		4.0		mJ
R_{thJC}				0.6 K/W
R_{thCK}		0.15		K/W



Reverse Diode (FRED) (IXGR40N60BD1)		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
Symbol	Test Conditions	min.	typ.	max.
V_F	$I_F = I_T$, $V_{GE} = 0\text{ V}$, Note 1			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.

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