

HiPerFAST™ IGBT

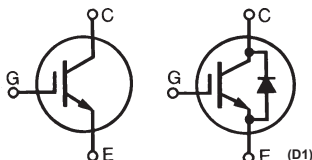
ISOPLUS247™

(Electrically Isolated Backside)

IXGR 40N60C
IXGR 40N60CD1

$$\begin{aligned} V_{CES} &= 600 \text{ V} \\ I_{C25} &= 75 \text{ A} \\ V_{CE(sat)} &= 2.7 \text{ V} \\ t_{fi(typ)} &= 75 \text{ ns} \end{aligned}$$

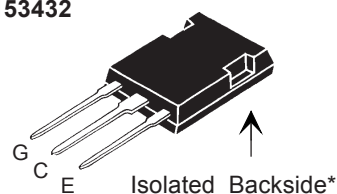
Preliminary Data Sheet



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	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	75	A
I_{C110}	$T_C = 110^\circ\text{C}$	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	$I_{CM} = 80$ @ $0.8 V_{CES}$	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

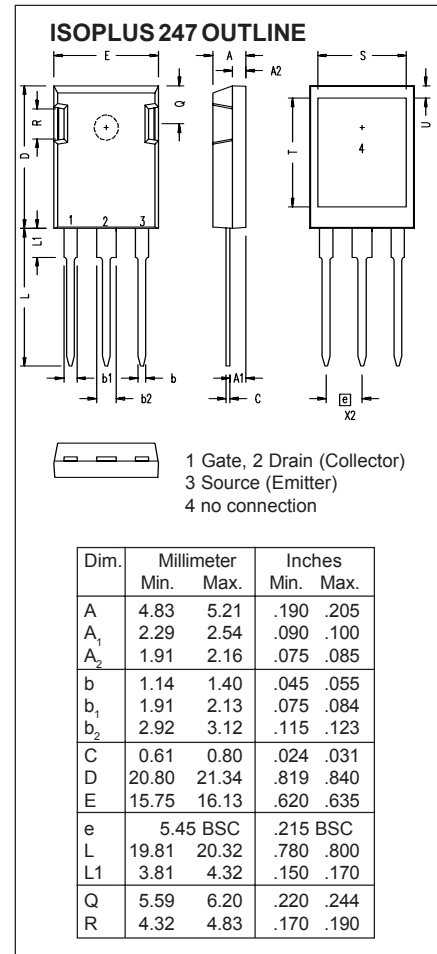
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

Advantages

- Easy assembly
- High power density
- 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}	$I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$ $I_C = 750 \mu\text{A}$	40N60C 600		V
		40N60CD1 600		
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$ $I_C = 500 \mu\text{A}$	40N60C 2.5		5.0 V
		40N60CD1 2.5		5.0 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}, T_J = 25^\circ\text{C}$ $V_{GE} = 0 \text{ V}; \text{note 1 } T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ $T_J = 125^\circ\text{C}$	40N60C 40N60CD1 40N60C 40N60CD1		200 μA 650 μA 1 mA 3 mA
I_{GES}	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = I_T, V_{GE} = 15 \text{ V}$		2.5	2.7 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	40	S
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$	40N60C 40N60CD1	3300	pF
C_{oes}			310	pF
C_{res}			370	pF
Q_g			65	pF
Q_{ge}	$I_C = I_T$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		116	nC
Q_{gc}			23	nC
Q_{gc}			55	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
$t_{d(off)}$			100	ns
t_{fi}			75	ns
E_{off}			0.85	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}			35	ns
E_{on}			0.4	mJ
$t_{d(off)}$			1.2	mJ
t_{fi}			150	ns
E_{off}			105	ns
R_{thJC}			0.6	K/W
R_{thCK}			0.15	K/W



Reverse Diode (FRED) (IXGR40N60CD1 only)		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	$T_J = 150^\circ\text{C}$ $T_J = 25^\circ\text{C}$		1.3 V 1.8 V
I_{RM}	$I_F = I_T$, $V_{GE} = 0\text{ V}$, $V_R = 100\text{ V}$ $-di_F/dt = 100\text{ A}/\mu\text{s}$	$T_J = 100^\circ\text{C}$		7.5 A
t_{rr}	$I_F = 1\text{ A}$; $-di/dt = 100\text{ A}/\mu\text{s}$; $V_R = 30\text{ V}$		3.5	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:

4,850,072	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
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	6,683,344