



**THE DATASHEET OF
IXGR40N60CD1**

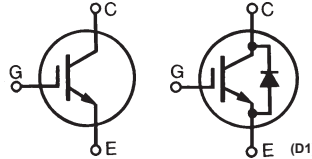


HiPerFAST™ IGBT ISOPLUS247™ (Electrically Isolated Backside)

IXGR 40N60C
IXGR 40N60CD1

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

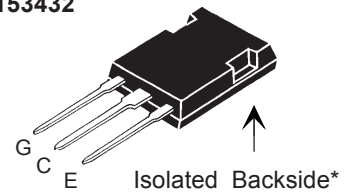
Preliminary Data Sheet



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	± 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

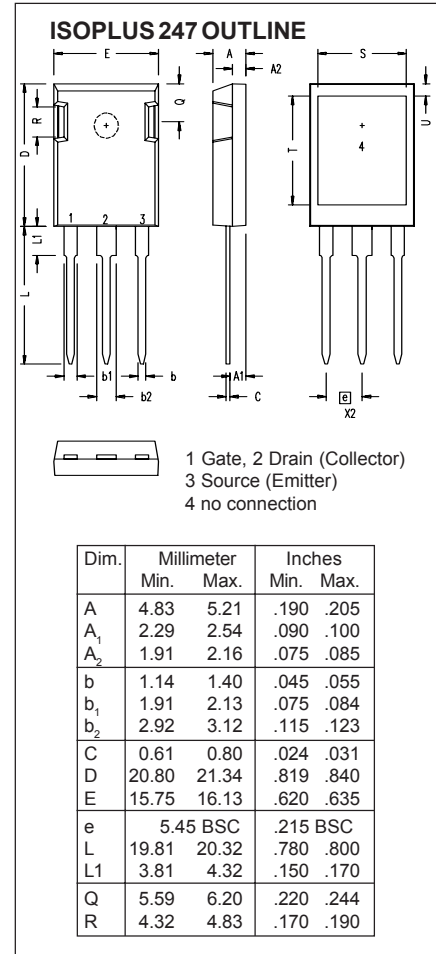
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

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}	$I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$	40N60C	600	V
	$I_C = 750 \mu\text{A}$	40N60CD1	600	
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	40N60C	2.5	5.0 V
	$I_C = 500 \mu\text{A}$	40N60CD1	2.5	5.0 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}, T_J = 25^\circ\text{C}$ $V_{GE} = 0 \text{ V}; \text{note } 1, T_J = 25^\circ\text{C}$	$T_J = 25^\circ\text{C}$	40N60C	200 μA
		$T_J = 25^\circ\text{C}$	40N60CD1	650 μA
		$T_J = 125^\circ\text{C}$	40N60C	1 mA
		$T_J = 125^\circ\text{C}$	40N60CD1	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, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$	30	40	S	
C_{ies}	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	40N60C	3300	pF	
C_{oes}		40N60CD1	310	pF	
C_{res}			370	pF	
			65	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	
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_T, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 \cdot V_{CES}, R_G = R_{off} = 4.7\ \Omega$ 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	150	ns
t_{fi}			75	150	ns
E_{off}			0.85	1.70	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_T, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 \cdot V_{CES}, R_G = R_{off} = 4.7\ \Omega$ 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}		40N60C	0.4	mJ	
$t_{d(off)}$		40N60CD1	1.2	mJ	
t_{fi}			150	ns	
E_{off}			105	ns	
			1.2	mJ	
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
		$T_J = 25^\circ\text{C}$		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.







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