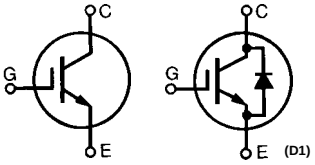
IXYS

HiPerFAST™ IGBT ISOPLUS247™

(Electrically Isolated Backside)

IXGR 40N60B
IXGR 40N60BD1

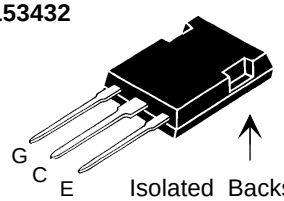
V_{CES} = 600 V
I_{C25} = 70 A
$V_{CE(sat)}$ = 2.1 V
$t_{fi(typ)}$ = 180 ns



Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	600	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	600	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	70	A
I_{C90}	T_C = 90°C	35	A
I_{CM}	T_C = 25°C, 1 ms	150	A
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 125°C, R_G = 10 Ω Clamped inductive load, L = 100 µH	I_{CM} = 80 @ 0.8 V_{CES}	A
P_C	T_C = 25°C	200	W
T_J		-40 ... +150	°C
T_{JM}		150	°C
T_{stg}		-40 ... +150	°C
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
Weight		5	g

ISOPLUS 247

E153432



G = Gate, C = Collector
E = Emitter

* Patent pending

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
BV_{CES}	I_C = 250 µA, V_{GE} = 0 V	40N60B	600			V
	I_C = 750 µA	40N60BD1	600			V
$V_{GE(th)}$	I_C = 250 µA, V_{CE} = V_{GE}	40N60B	2.5		5.0	V
	I_C = 500 µA	40N60BD1	2.5		5.0	V
I_{CES}	V_{CE} = 0.8 V_{CES} T_J = 25°C	40N60B			200	µA
	V_{GE} = 0 V; note 1 T_J = 25°C	40N60BD1			650	µA
	T_J = 125°C	40N60B			1	mA
	T_J = 125°C	40N60BD1			3	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = I_T, V_{GE} = 15 V			1.6	2.1	V

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

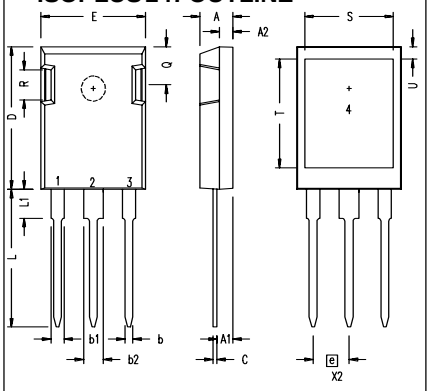
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

Advantages

- Easy assembly
- High power density

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)		Characteristic Values min.	typ.	max.	
g_{fs}	$I_C = I_T$; V_{CE} = 10 V, Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %		30	42		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz			3300		pF
C_{oes}		40N60B		310		pF
		40N60BD1		370		pF
C_{res}				65		pF
Q_g	$I_C = I_T$, V_{GE} = 15 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°C**			25		ns
t_{ri}	$I_C = I_T$, V_{GE} = 15 V			30		ns
$t_{d(off)}$	V_{CE} = 0.8 V_{CES}, $R_G = R_{off}$ = 4.7 Ω			180	300	ns
t_{fi}	Remarks: Switching times may increase			180	270	ns
E_{off}	for V_{CE} (Clamp) > 0.8 V_{CES}, higher T_J or increased R_G			2.7	4.0	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**			25		ns
t_{ri}	$I_C = I_T$, V_{GE} = 15 V			30		ns
E_{on}	V_{CE} = 0.8 V_{CES}, $R_G = R_{off}$ = 4.7 Ω	40N60B		0.4		mJ
$t_{d(off)}$		40N60BD1		1.2		mJ
t_{fi}	Remarks: Switching times may increase for V_{CE} (Clamp) > 0.8 V_{CES},			300		ns
E_{off}	higher T_J or increased R_G			270 4.0		ns mJ
R_{thJC}					0.6	K/W
R_{thCK}				0.15		K/W

ISOPLUS 247 OUTLINE



1 Gate, 2 Drain (Collector)
3 Source (Emitter)
4 no connection

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.83	5.21	.190	.205
A_1	2.29	2.54	.090	.100
A_2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b_1	1.91	2.13	.075	.084
b_2	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190

Reverse Diode (FRED) (IXGR40N60BD1)

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

Note: 1. Pulse test, t_p ≤ 300 ms, duty cycle:d ≤ 2 %
2. I_T = 40A