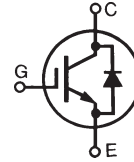


High Voltage IGBT with Diode

(Electrically Isolated Back Surface)

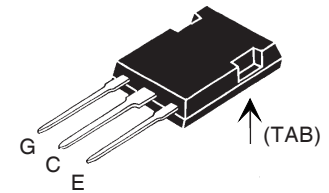
IXGR 35N120BD1



$$\begin{aligned} V_{CES} &= 1200 \text{ V} \\ I_{C25} &= 54 \text{ A} \\ V_{CE(sat)} &= 3.5 \text{ V} \\ t_{fi(typ)} &= 160 \text{ ns} \end{aligned}$$

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	1200	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	54	A
I_{C110}	$T_C = 110^\circ\text{C}$	28	A
I_{F110}	$T_C = 110^\circ\text{C}$	8	A
I_{CM}	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	200	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}, T_J = 125^\circ\text{C}, R_G = 10 \Omega$ Clamped inductive load	$I_{CM} = 120$ @ $0.8 V_{CES}$	A
P_C	$T_C = 25^\circ\text{C}$	250	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, RMS, $t = 1 \text{ min}$ $I_{SOL} = 1 \text{ mA}, t = 1 \text{ s}$	2500 3000	V~ V~
F_C	Mounting force	22...130/5...29	N/lb
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
Weight		6	g

ISOPLUS247 (IXGR)



G = Gate
E = Emitter
C = Collector
TAB = Electrically Isolated

Features

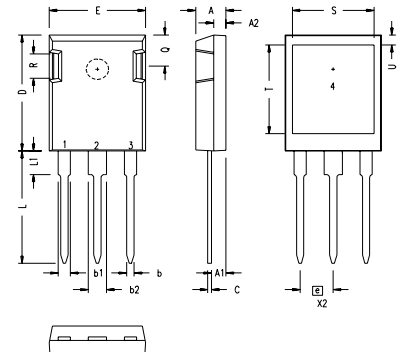
- Silicon chip on DCB substrate
 - High power dissipation
 - Isolated mounting surface
 - 2500V electrical isolation
- IGBT and anti-parallel FRED for resonant power supplies
 - Induction heating
 - Rice cookers
- MOS Gate turn-on
 - drive simplicity
- Fast Recovery Expitaxial Diode (FRED)
 - soft recovery with low I_{RM}

Advantages

- Saves space (two devices in one package)
- Easy to mount
- Reduces assembly time and cost

Symbol	Test Conditions	Characteristic Values		
(T _J = 25°C, unless otherwise specified)		min.	typ.	max.
V _{GE(th)}	I _C = 250 μA, V _{CE} = V _{GE}	2.5		5.0 V
I _{CES}	V _{CE} = V _{CES} T=25°C			50 μA
	V _{GE} = 0 V T=125°C			250 μA
I _{GES}	V _{CE} = 0 V, V _{GE} = ±20 V			±100 nA
V _{CE(sat)}	I _C = 35A, V _{GE} = 15 V Note 2		2.8	3.5 V

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = 35\text{A}; V_{CE} = 10\text{V}$, Note 2.	28	38	S
C_{ies}			2300	pF
C_{oes}	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		190	pF
C_{res}			80	pF
Q_g			140	nC
Q_{ge}	$I_C = 40\text{A}, V_{GE} = 15\text{V}, V_{CE} = 0.5 V_{CES}$		20	nC
Q_{gc}			50	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$		40	ns
t_{ri}	$I_C = 35\text{A}; V_{GE} = 15\text{V}$		50	ns
E_{on}	$V_{CE} = 0.8 V_{CES}; R_G = R_{off} = 3\ \Omega$		0.9	mJ
$t_{d(off)}$	Note 1.		270	500 ns
t_{fi}			160	300 ns
E_{off}			3.8	7.0 mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$		45	ns
t_{ri}	$I_C = 35\text{A}; V_{GE} = 15\text{V}$		60	ns
E_{on}	$V_{CE} = 0.8 V_{CES}; R_G = R_{off} = 3\ \Omega$		1.9	mJ
$t_{d(off)}$	Note 1		380	ns
t_{fi}			400	ns
E_{off}			8.0	mJ
R_{thJC}				0.5 K/W
R_{thCK}			0.25	K/W

ISOPLUS247 Outline


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

- 1 – GATE
 2 – DRAIN (COLLECTOR)
 3 – SOURCE (EMITTER)
 4 – NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_F	$I_F = 10\text{A}, V_{GE} = 0\text{V}$ $I_F = 10\text{A}, V_{GE} = 0\text{V}, T_J = 125^\circ\text{C}$			3.3 V 2.2 V
I_{RM}	$I_F = 10\text{A}; -di_F/dt = 100\text{A}/\mu\text{s}, V_R = 100\text{V}$		4.0	A
t_{rr}	$V_{GE} = 0\text{V}; T_J = 125^\circ\text{C}$		190	ns
t_{rr}	$I_F = 1\text{A}; -di_F/dt = 100\text{A}/\mu\text{s}; V_R = 30\text{V}, V_{GE} = 0\text{V}$		40	ns
R_{thJC}				2.5 K/W

- Notes:
- Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G .
 - Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$.

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	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585
	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	