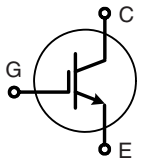
High Voltage IGBT with optional Diode ISOPLUS™ package

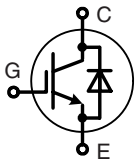
(Electrically Isolated Back Side)

V_{CES} = 1200 V
I_{C25} = 50 A
$V_{CE(sat)\ typ}$ = 2.4 V

Short Circuit SOA Capability
Square RBSOA

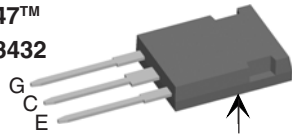


IXDR 30N120



IXDR 30N120 D1

ISOPLUS 247™
E153432



Isolated Backside*

G = Gate C = Collector E = Emitter

Symbol	Conditions		Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C		1200	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 20 kΩ		1200	V
V_{GES}	Continuous		±20	V
V_{GEM}	Transient		±30	V
I_{C25}	T_C = 25°C		50	A
I_{C90}	T_C = 90°C		30	A
I_{CM}	T_C = 90°C, t_p = 1 ms		60	A
RBSOA	V_{GE} = ±15 V, T_J = 125°C, R_G = 47 Ω Clamped inductive load, L = 30 mH		I_{CM} = 50 $V_{CEK} < V_{CES}$	A
t_{SC} (SCSOA)	V_{GE} = ±15 V, V_{CE} = V_{CES}, T_J = 125°C R_G = 47 Ω, non repetitive		10	µs
P_C	T_C = 25°C	IGBT Diode	200 95	W W
T_J			-55 ... +150	°C
T_{stg}			-55 ... +150	°C
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq$ 1 mA		2500	V~
Weight			6	g

Symbol	Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
$V_{(BR)CES}$	V_{GE} = 0 V	1200			V
$V_{GE(th)}$	I_C = 1 mA, V_{CE} = V_{GE}	4.5		6.5	V
I_{CES}	V_{CE} = V_{CES}, T_J = 25°C T_J = 125°C		 2.5	1.5 	mA mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V			± 500	nA
$V_{CE(sat)}$	I_C = 30 A, V_{GE} = 15 V		2.4	2.9	V

Features

- NPT IGBT technology
  - high switching speed
  - low switching losses
  - square RBSOA, no latch up
  - high short circuit capability
  - positive temperature coefficient for easy paralleling
  - MOS input, voltage controlled
  - fast recovery epitaxial diode
- Epoxy meets UL 94V-0
- Isolated and UL registered E153432

Advantages

- DCB Isolated mounting tab
- Meets TO-247AD package Outline
- Package for clip or spring mounting
- Space savings
- High power density

Typical Applications

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

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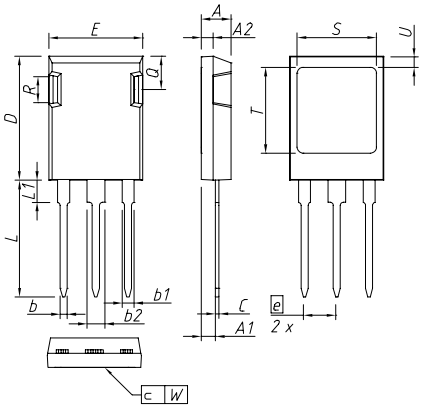
Symbol	Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		1650		pF
C_{oes}			250		pF
C_{res}			110		pF
Q_g	I_C = 30 A, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		120		nC
$t_{d(on)}$	**Inductive load, T_J = 125°C** I_C = 30 A, V_{GE} = ±15 V, V_{CE} = 600 V, R_G = 47 Ω		100		ns
t_r			70		ns
$t_{d(off)}$			500		ns
t_f			70		ns
E_{on}			4.6		mJ
E_{off}			3.4		mJ
R_{thJC}				0.6	K/W
R_{thCH}	Package with heatsink compound		0.25		K/W

Reverse Diode (FRED)

Symbol	Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_F	I_F = 30 A, V_{GE} = 0 V		2.5	2.75	V
	I_F = 30 A, V_{GE} = 0 V, T_J = 125°C		2.0		V
I_F	T_C = 25°C			50	A
	T_C = 90°C			27	A
I_{RM}	I_F = 30 A, $-di_F/dt$ = 400 A/µs, V_R = 600 V		20		A
t_{rr}	V_{GE} = 0 V, T_J = 125°C		200		ns
t_{rr}	I_F = 1 A, $-di_F/dt$ = 100 A/µs, V_R = 30 V, V_{GE} = 0 V		40		ns
R_{thJC}				1.3	K/W

ISOPLUS247™ OUTLINE



DIM.	MILLIMETER MIN	MAX	INCHES MIN	MAX
A	4,83	5,21	0,190	0,205
A1	2,29	2,54	0,090	0,100
A2	1,91	2,16	0,075	0,085
b	1,14	1,40	0,045	0,055
b1	1,91	2,15	0,075	0,085
b2	2,92	3,20	0,115	0,126
C	0,61	0,83	0,024	0,033
D	20,80	21,34	0,819	0,840
E	15,75	16,13	0,620	0,635
e	5,45 BSC		0,215 BSC	
L	19,81	20,60	0,780	0,811
L1	3,81	4,38	0,150	0,172
Q	5,59	6,20	0,220	0,244
R	4,32	4,85	0,170	0,191
S	13,21	13,72	0,520	0,540
T	15,75	16,26	0,620	0,640
U	1,65	2,03	0,065	0,080
W	-	0,10	-	0,004

The convex bow of substrate is typ. < 0.04 mm over plastic surface level of device bottom side
This drawing will meet all dimensions requirement of JEDEC outline TO-247 AD except screw hole and except Lmax.

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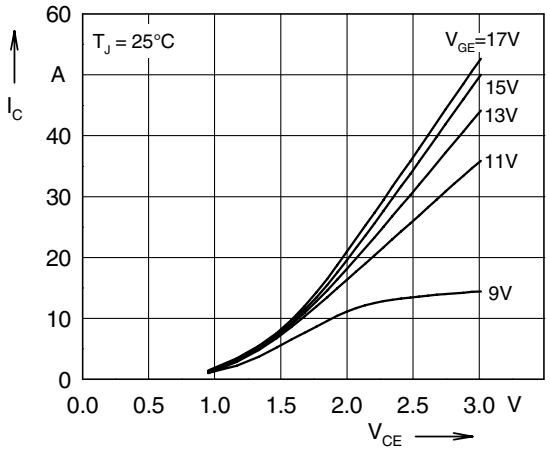

Fig. 1 Typ. output characteristics

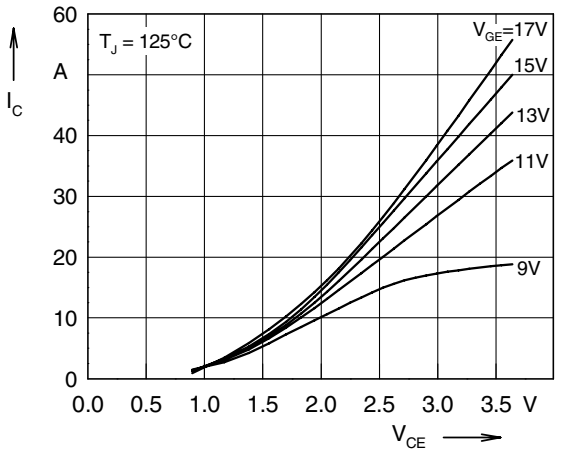

Fig. 2 Typ. output characteristics

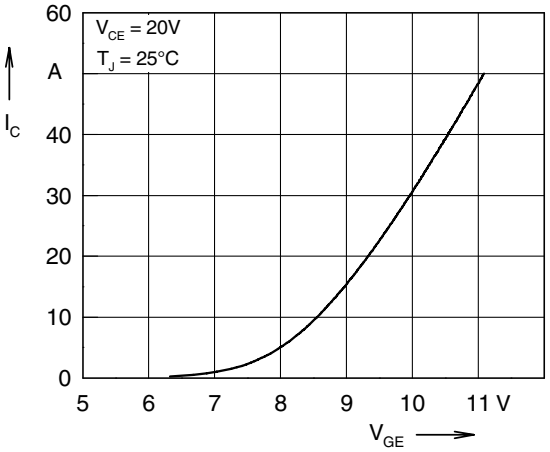

Fig. 3 Typ. transfer characteristics

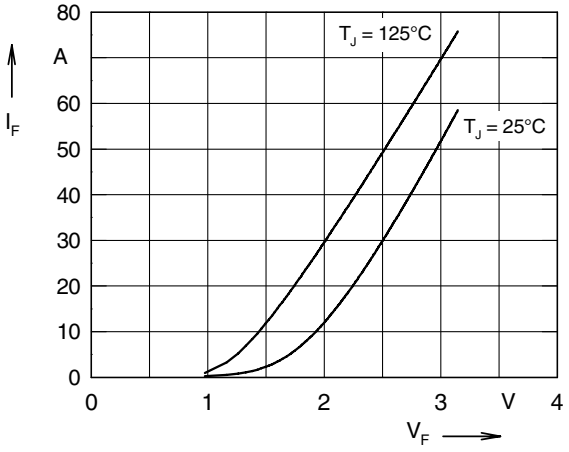

Fig. 4 Typ. forward characteristics of free wheeling diode

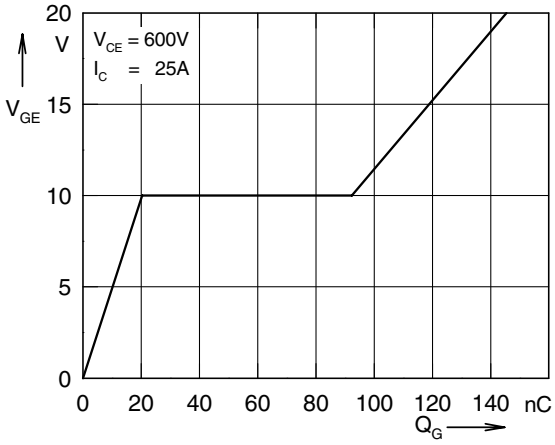

Fig. 5 Typ. turn on gate charge

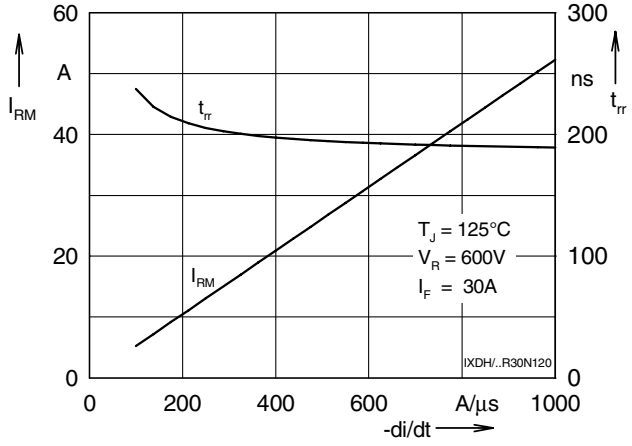

Fig. 6 Typ. turn off characteristics of free wheeling diode

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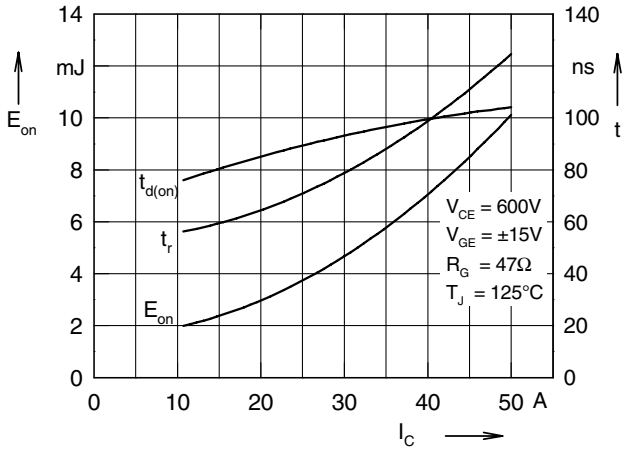

Fig. 7 Typ. turn on energy and switching times versus collector current

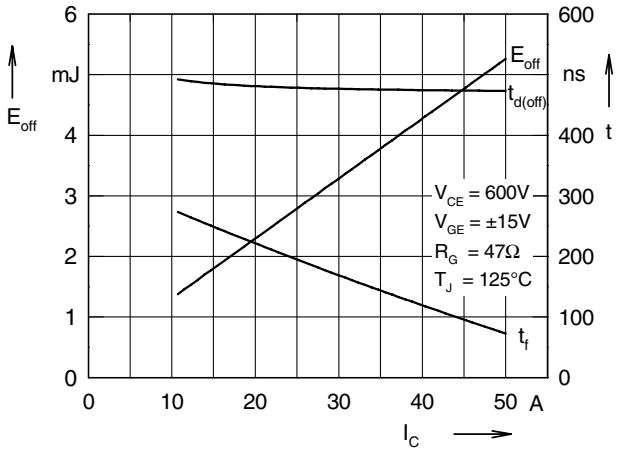

Fig. 8 Typ. turn off energy and switching times versus collector current

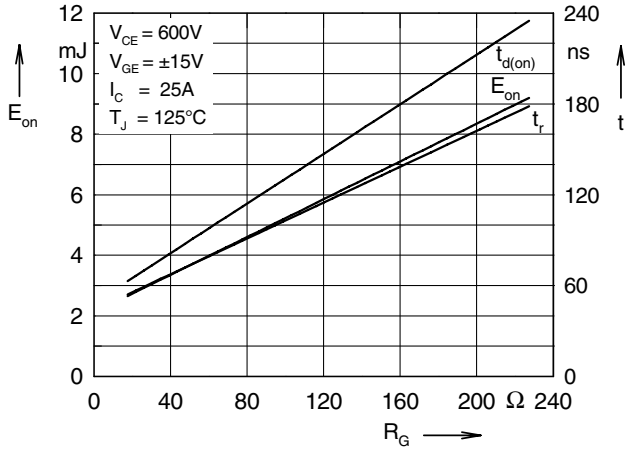

Fig. 9 Typ. turn on energy and switching times versus gate resistor

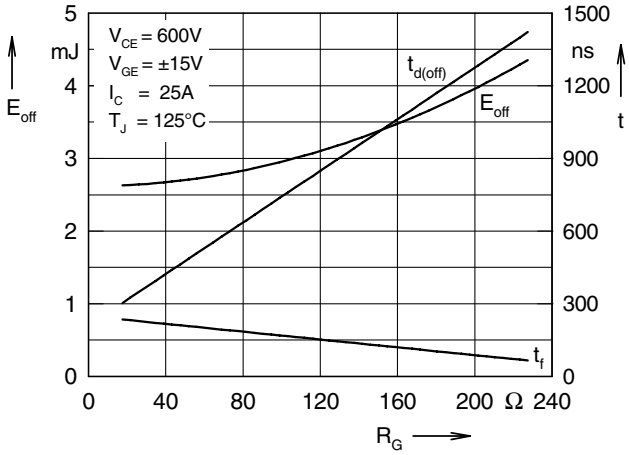

Fig.10 Typ. turn off energy and switching times versus gate resistor

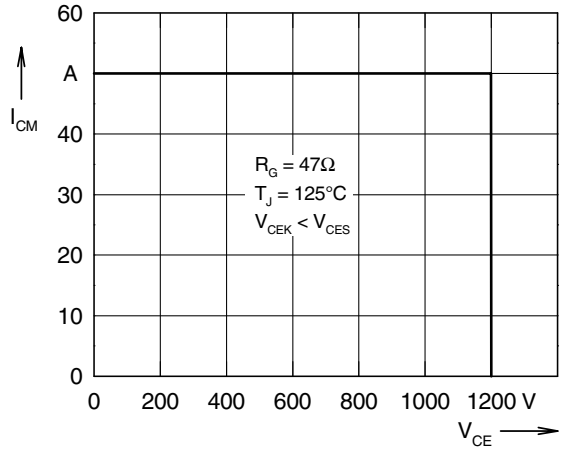

Fig. 11 Reverse biased safe operating area RBSOA

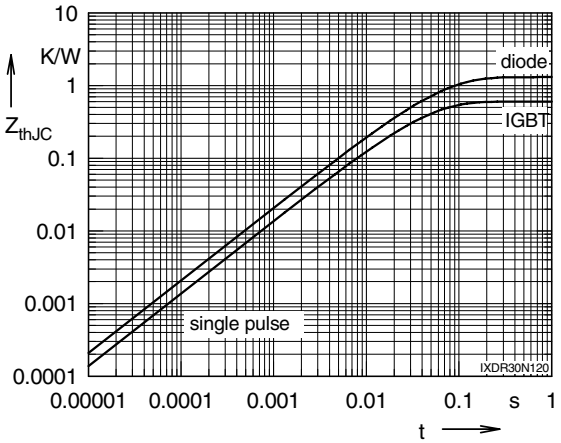

Fig. 12 Typ. transient thermal impedance

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