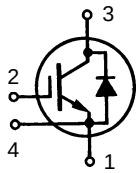
IXYS

IGBT with Diode IXSN 35N100U1

V_{CES} = 1000 V
I_{C25} = 38 A
$V_{CE(sat)}$ = 3.5 V

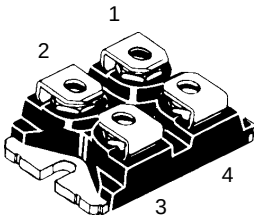
High Short Circuit SOA Capability



Symbol	Test Conditions		Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C		1000	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ		1000	A
V_{GES}	Continuous		±20	V
V_{GEM}	Transient		±30	V
I_{C25}	T_C = 25°C		38	A
I_{C90}	T_C = 90°C		25	A
I_{CM}	T_C = 25°C, 1 ms		50	A
SSOA (RBSOA)	V_{GE}= 15 V, T_{VJ} = 125°C, R_G = 22 Ω Clamped inductive load, L = 30 µH		I_{CM} = 50 @ 0.8 V_{CES}	A
t_{SC} **(SCSOA)**	V_{GE}= 15 V, V_{CE} = 0.6 • V_{CES}, T_J = 125°C R_G = 22 Ω, non repetitive		10	µs
P_C	T_C = 25°C		205	W
V_{ISOL}	50/60 Hz I_{ISOL} ≤ 1 mA	t = 1 min t = 1 s	2500 3000	V~ V~
T_J			-40 ... +150	°C
T_{JM}			150	°C
T_{stg}			-40 ... +150	°C
M_d	Mounting torque Terminal connection torque (M4)		1.5/13 1.5/13	Nm/lb.in. Nm/lb.in.
Weight			30	g

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
BV_{CES}	I_C = 6 mA, V_{GE} = 0 V		1000			V
$V_{GE(th)}$	I_C = 10 mA, V_{CE} = V_{GE}		5		8	V
I_{CES}	V_{CE} = 0.8 • V_{CES} V_{GE} = 0 V	T_J = 25°C T_J = 125°C			750 15	µA mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±500	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15 V				3.5	V

miniBLOC, SOT-227 B



1 = Emitter, 3 = Collector
2 = Gate, 4 = Kelvin Emitter

Features
- International standard package miniBLOC (ISOTOP) compatible
- Isolation voltage 3000 V~
- 2nd generation HDMOS™ process
  - for high short circuit SOA
- Low $V_{CE(sat)}$
  - for minimum on-state conduction losses
- MOS Gate turn-on
  - drive simplicity
- Fast Recovery Epitaxial Diode (FRED)
  - short t_{rr} and I_{RM}
- Low collector-to-case capacitance (< 50 pF)
  - reducesd RFI
- Low package inductance (< 10 nH)
  - easy to drive and to protect

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

Advantages
- Space savings
- Easy to mount with 2 screws
- High power density

IXYS reserves the right to change limits, test conditions and dimensions.

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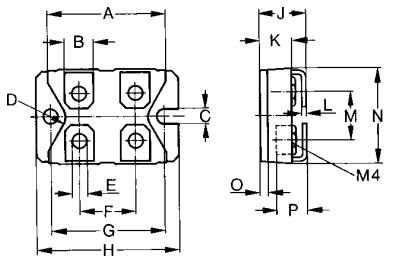
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	min.	typ.	max.	
g_{fs}	$I_C = I_{C90}$; V_{CE} = 20 V, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %	10	20		S
$I_{C(on)}$	V_{GE} = 15 V		300		A
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		4.5		nF
C_{oes}			0.5		nF
C_{res}			0.09		nF
Q_g	$I_C = I_{C90}$, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		180		nC
Q_{ge}			45		nC
Q_{gc}			120		nC
$t_{d(on)}$	**Inductive load, T_J = 125°C**		80		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V,		150		ns
$t_{d(off)}$	V_{CE} = 0.6 • V_{CES}, R_{on} = 6.8 Ω, R_{off} = 22 Ω		800		ns
t_{fi}	Remarks: Switching times may increase for V_{CE} (Clamp) > 0.6 • V_{CES}, higher T_J or increased R_G		2000		ns
E_{on}			3.2		mJ
E_{off}			6.8		mJ
R_{thJC}				0.61	K/W
R_{thCK}			0.05		K/W

miniBLOC, SOT-227 B



M4 screws (4x) supplied

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	31.5	31.7	1.241	1.249
B	7.8	8.2	0.307	0.323
C	4.0	-	0.158	-
D	4.1	4.3	0.162	0.169
E	4.1	4.3	0.162	0.169
F	14.9	15.1	0.587	0.595
G	30.1	30.3	1.186	1.193
H	38.0	38.2	1.497	1.505
J	11.8	12.2	0.465	0.481
K	8.9	9.1	0.351	0.359
L	0.75	0.85	0.030	0.033
M	12.6	12.8	0.496	0.504
N	25.2	25.4	0.993	1.001
O	1.95	2.05	0.077	0.081
P	-	5.0	-	0.197

Reverse Diode (FRED)

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	min.	typ.	max.	
V_F	$I_F = I_{C90}$, V_{GE} = 0 V, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			2.3	V
I_{RM}	$I_F = I_{C90}$, V_{GE} = 0 V, -di_F/dt = 480 A/µs			33	A
t_{rr}	T_J = 125°C, V_R = 360 V		150		ns
R_{thJC}				0.7	K/W

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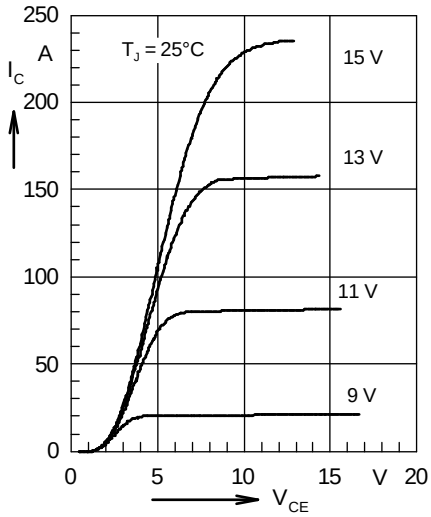

Fig. 1 Typ. output characteristics

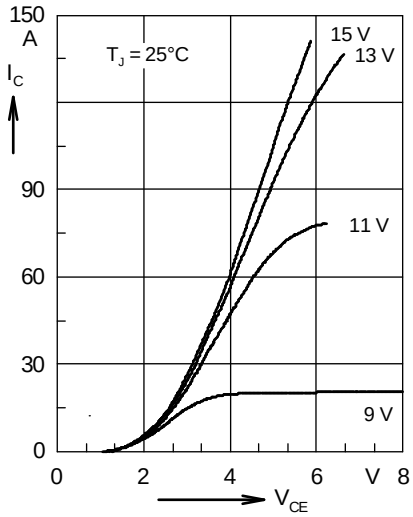

Fig. 2 Typ. output characteristics

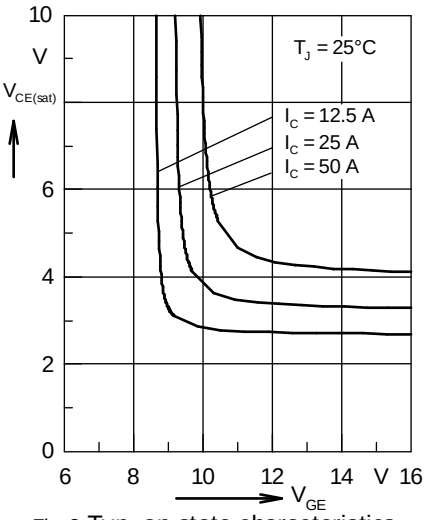

Fig. 3 Typ. on-state characteristics

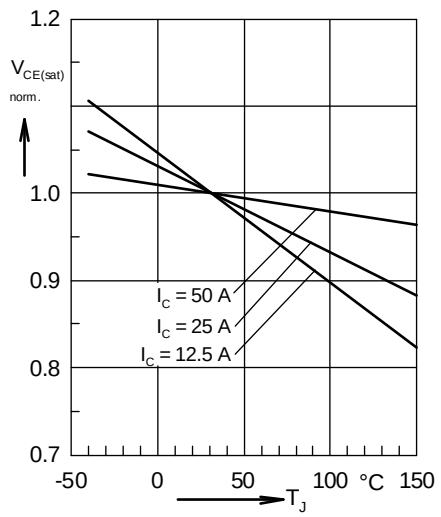

Fig. 4 Typ. temp. dependence of $V_{CE(sat)}$

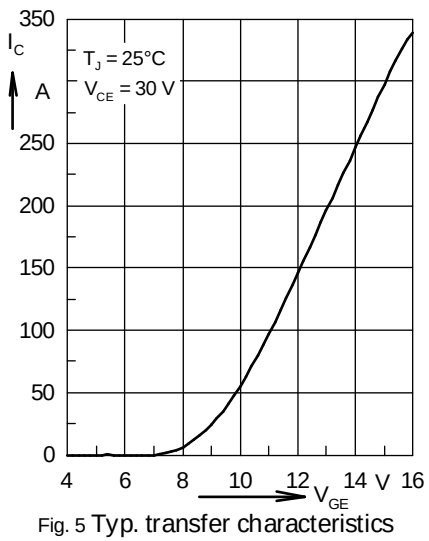

Fig. 5 Typ. transfer characteristics

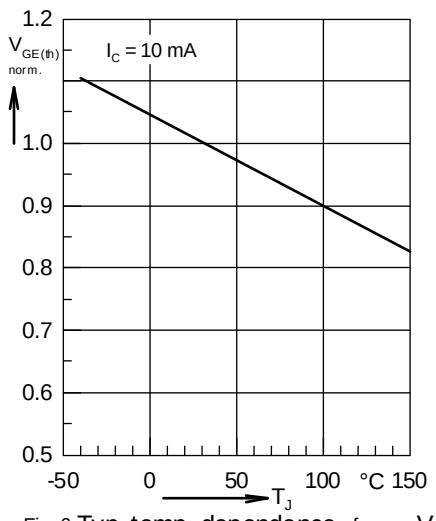

Fig. 6 Typ. temp. dependence of norm. $V_{GE(th)}$

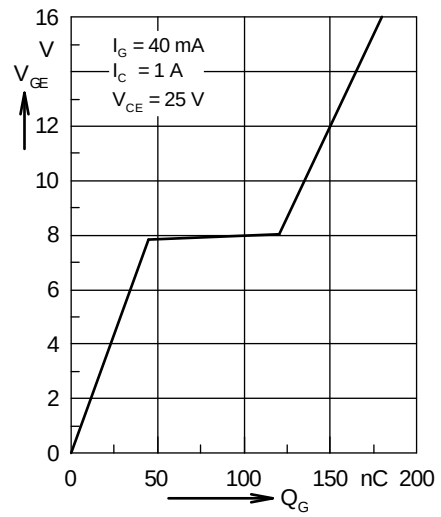

Fig. 7 Typ. turn-on gate charge characteristics, $V_{GE} = f(Q_G)$

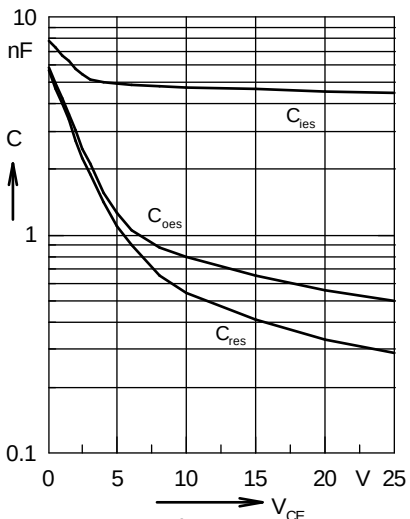

Fig. 8 Typ. capacitances

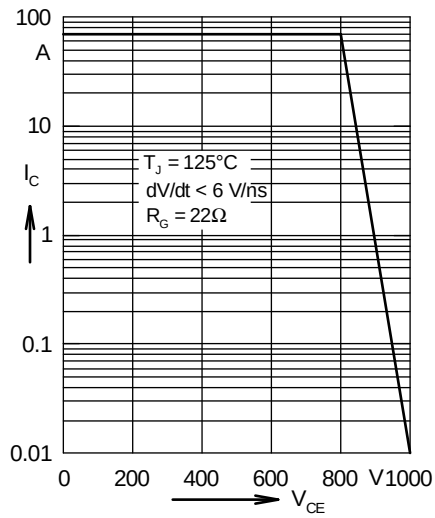

Fig. 9 Reverse biased safe operating area

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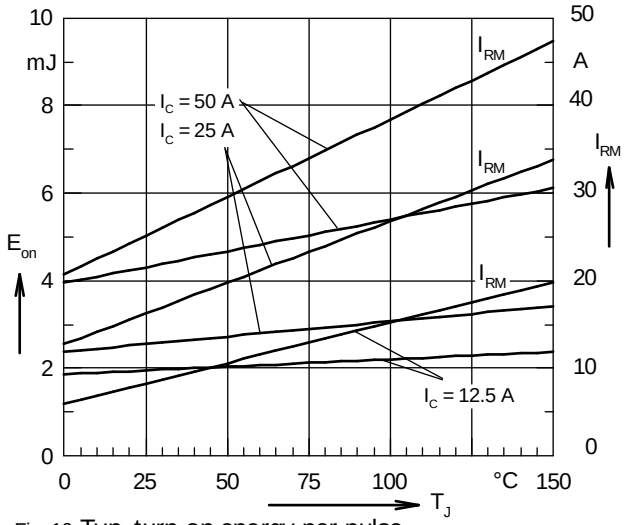

Fig. 10 Typ. turn-on energy per pulse

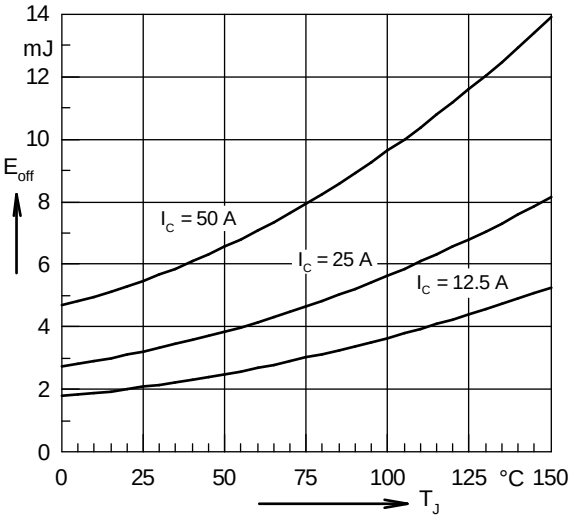

Fig. 11 Typ. turn-off energy per pulse

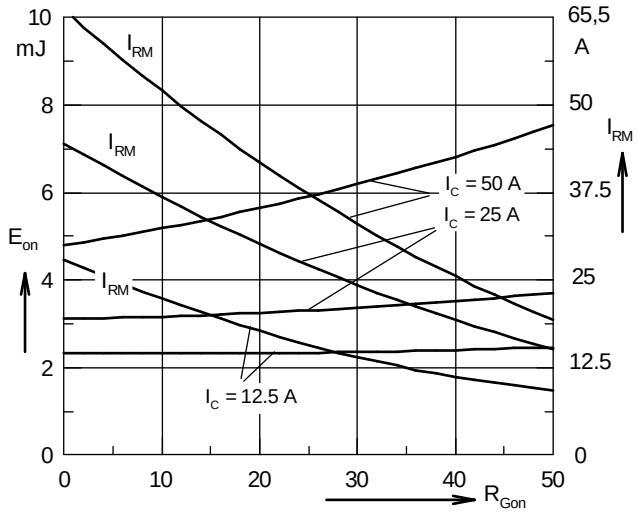

Fig. 12 Typ. turn-on energy per pulse

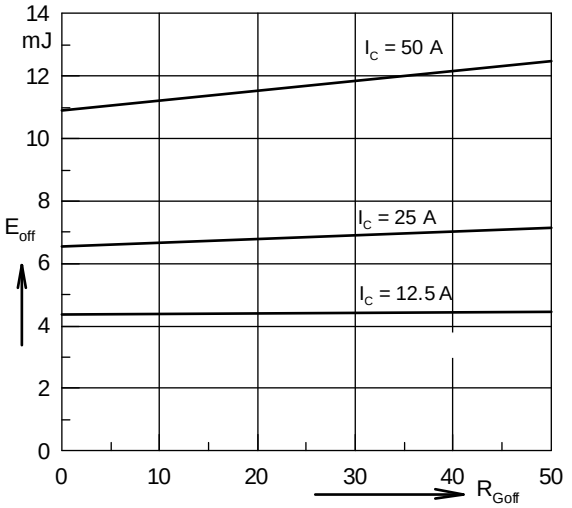

Fig. 13 Typ. turn-off energy per pulse

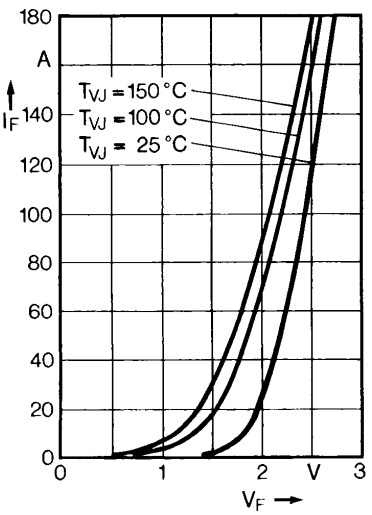

Fig. 14 Forward characteristic of reverse diode

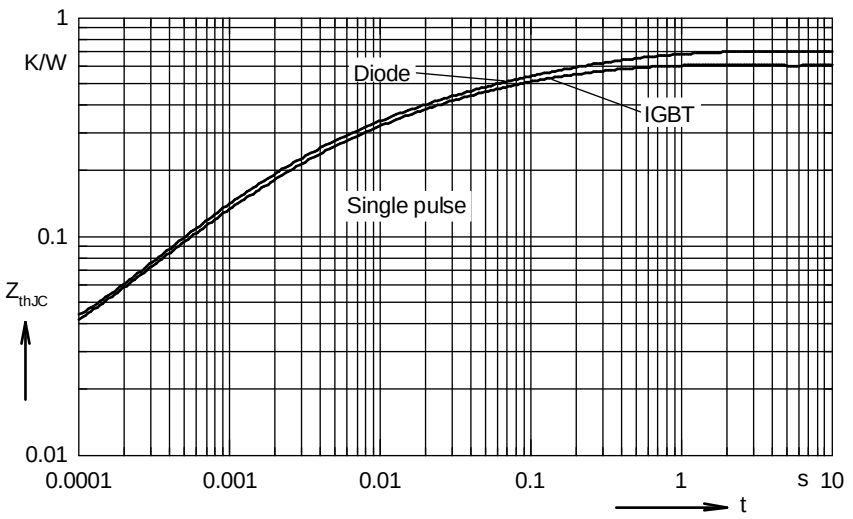

Fig. 15 Transient thermal resistance junction to case of IGBT and Diode

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