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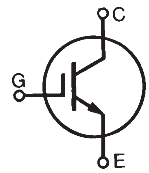
High Voltage IGBT

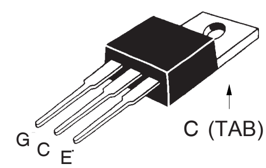
IXGP 28N120B

V_{CES}	=	1200 V
I_{C25}	=	50 A
$V_{CE(sat)}$	=	3.5 V
$t_{fi(typ)}$	=	160 ns



Symbol	Test 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} = 1 MΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	50	A
I_{C110}	T_C = 110°C	28	A
I_{CM}	T_C = 25°C, 1 ms	150	A
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 125°C, R_G = 5 Ω Clamped inductive load	I_{CM} = 60 @ 0.8 V_{CES}	A
P_C	T_C = 25°C	250	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
Maximum Lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
M_d	Mounting torque (M3.5) (TO-220)	0.55/5	Nm/lb.in.
Weight		4	g

TO-220 (IXGP)



G = Gate, C = Collector,
E = Emitter, TAB = Collector

Features

- High Voltage IGBT for resonant power supplies
  - Induction heating
  - Rice cookers
- International standard package JEDEC TO-220
- Low switching losses, low $V_{(sat)}$
- MOS Gate turn-on
  - drive simplicity

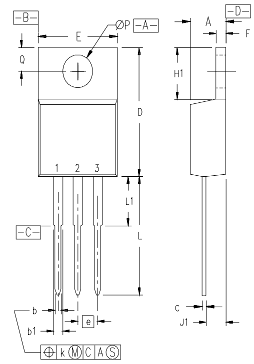
Advantages

- High power density
- Suitable for surface mounting
- Easy to mount with 1 screw

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		1200			V
$V_{GE(th)}$	I_C = 250 µA, V_{CE} = V_{GE}		2.5		5	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0 V	T_J = 25°C			25	µA
		T_J = 125°C			250	µA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = 28A, V_{GE} = 15 V			2.9	3.5	V
		T_J = 125°C		2.8		V

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	I_C = 28A; V_{CE} = 10 V, Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %	18	25		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		2700		pF
C_{oes}			170		pF
C_{res}			60		pF
Q_g	I_C = 28A, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		92		nC
Q_{ge}			15		nC
Q_{gc}			30		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		30		ns
t_{ri}	I_C = 28 A, V_{GE} = 15 V		20		ns
$t_{d(off)}$	V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 5 Ω		180	280	ns
t_{fi}			160	320	ns
E_{off}			2.0	5.0	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		35		ns
t_{ri}	I_C = 28A, V_{GE} = 15 V		28		ns
E_{on}	V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 5 Ω		1.4		mJ
$t_{d(off)}$			250		ns
t_{fi}			300		ns
E_{off}			8.0		mJ
R_{thJC}				0.5	K/W
R_{thCK}			0.25		K/W

TO-220 Outline



Pins: 1 - Gate 2 - Drain
3 - Source 4 - Drain

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70	13.97
L1	.110	.230	2.79	5.84
ØP	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

Fig. 1. Output Characteristics @ 25 Deg. C

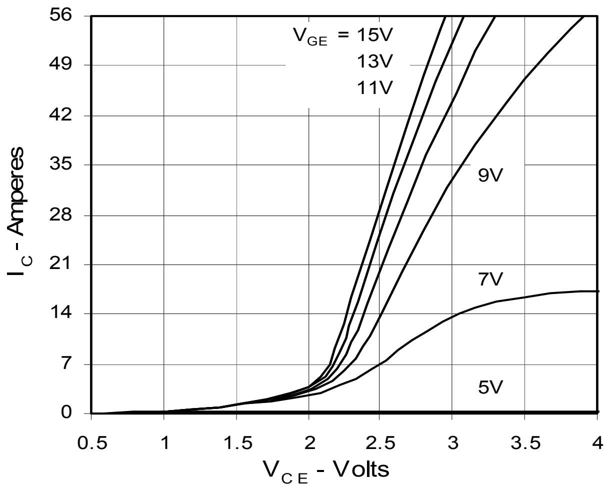


Fig. 2. Extended Output Characteristics @ 25 deg. C

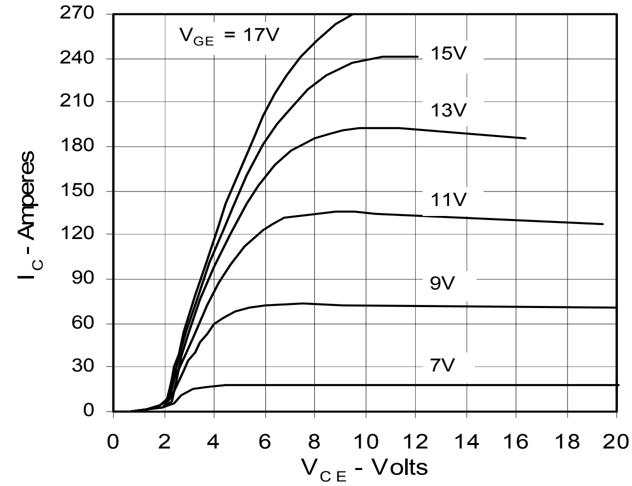


Fig. 3. Output Characteristics @ 125 Deg. C

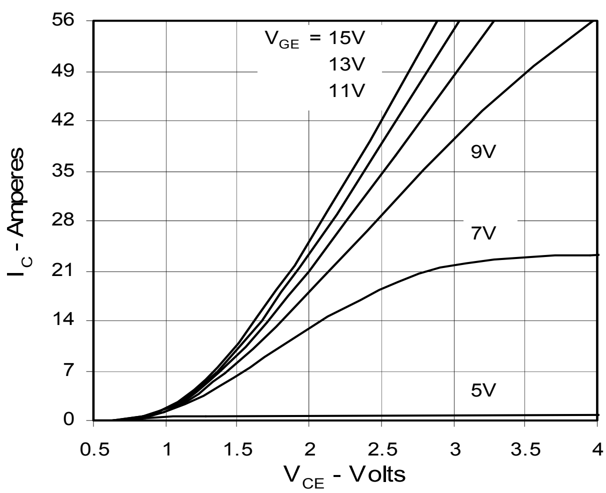


Fig. 4. Dependence of $V_{CE(sat)}$ on Temperature

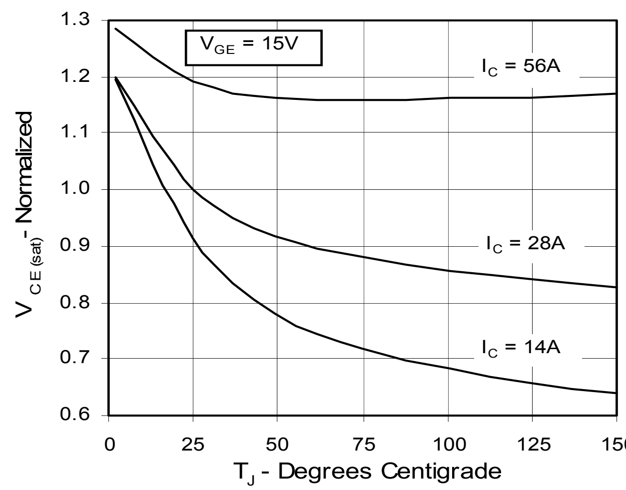


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter voltage

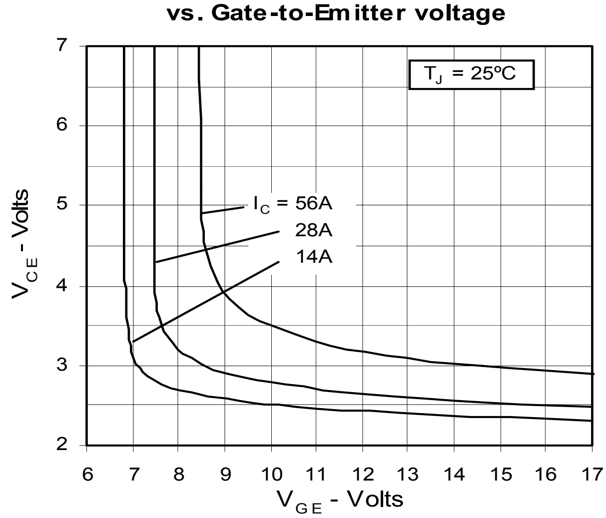


Fig. 6. Input Admittance

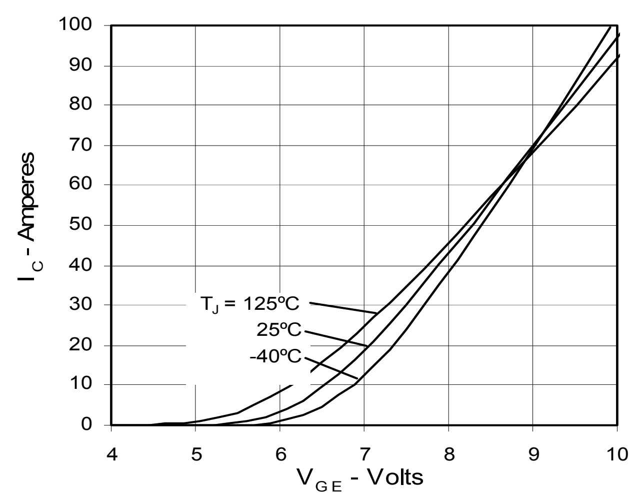


Fig. 7. Transconductance

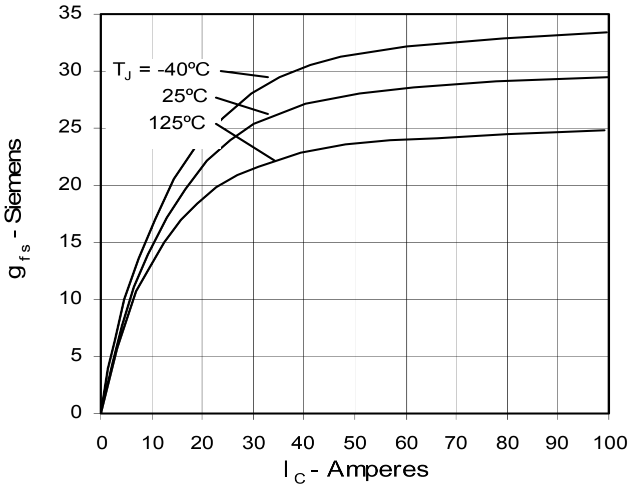


Fig. 8. Dependence of Turn-off Energy Loss on R_G

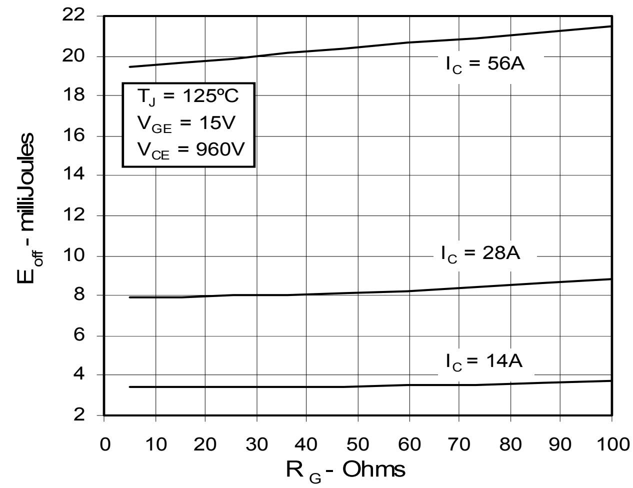


Fig. 9. Dependence of Turn-Off Energy Loss on I_C

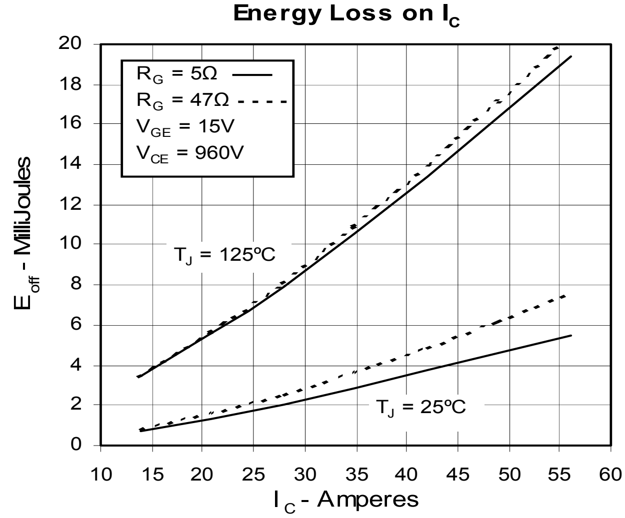


Fig. 10. Dependence of Turn-off Energy Loss on Temperature

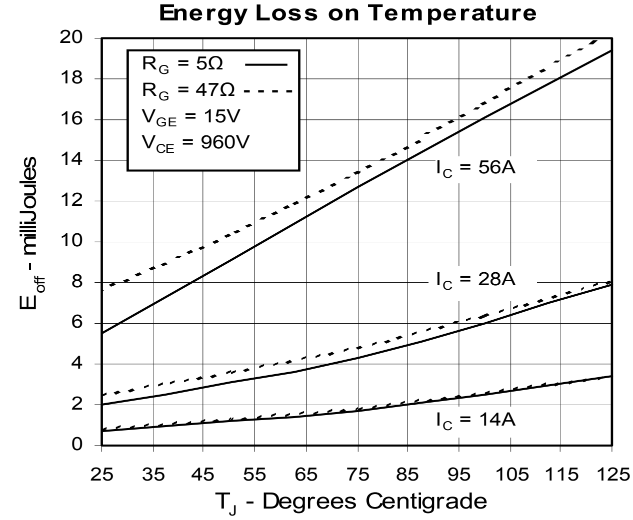


Fig. 11. Dependence of Turn-off Switching Time on R_G

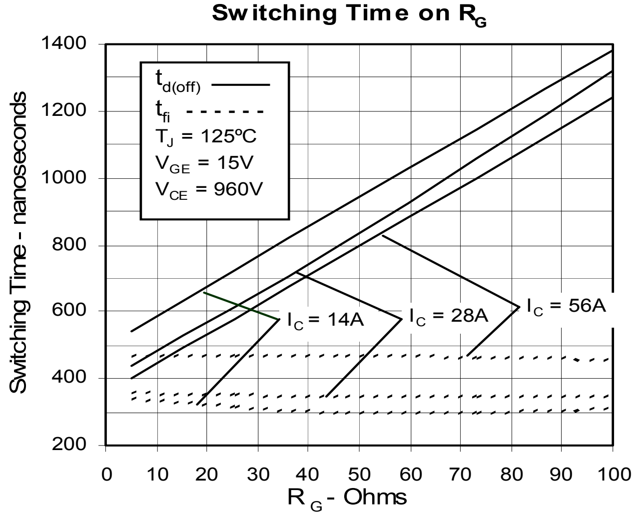
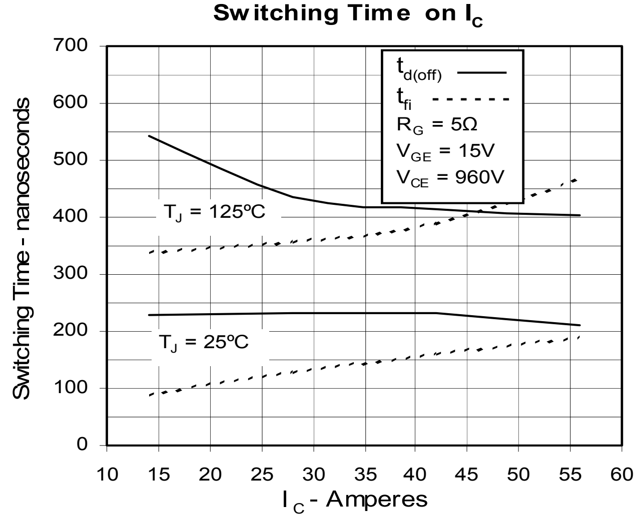


Fig. 12. Dependence of Turn-off Switching Time on I_C



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

Fig. 13. Dependence of Turn-off Switching Time on Temperature

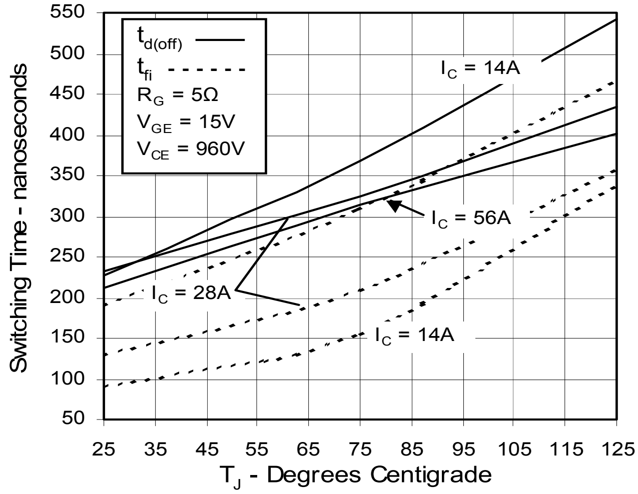


Fig. 14. Gate Charge

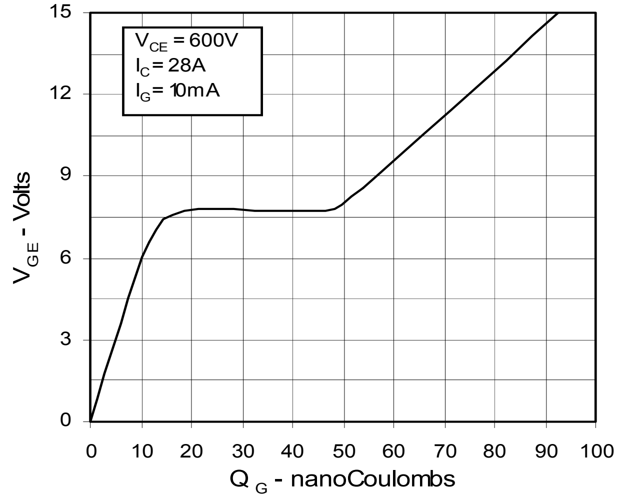


Fig. 15. Capacitance

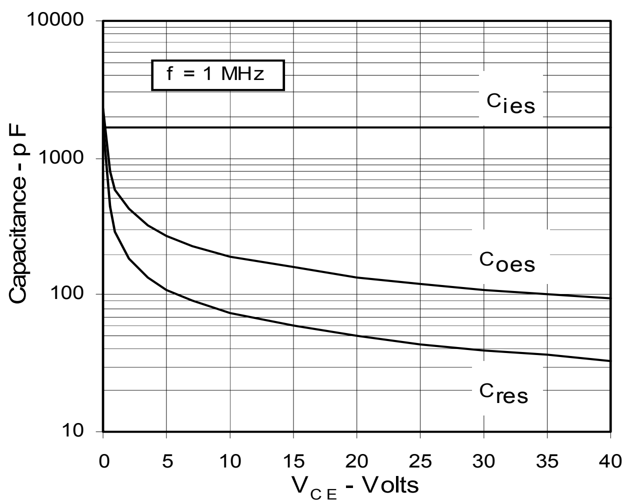


Fig. 16. Maximum Transient Thermal Resistance