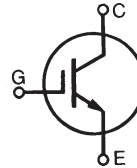


High Voltage IGBT

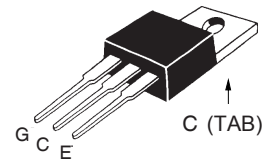
IXGP 28N120B

$$\begin{aligned} V_{CES} &= 1200 \text{ V} \\ I_{C25} &= 50 \text{ A} \\ V_{CE(sat)} &= 3.5 \text{ V} \\ t_{fi(typ)} &= 160 \text{ ns} \end{aligned}$$



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}	$T_C = 25^\circ\text{C}$	50	A
I_{C110}	$T_C = 110^\circ\text{C}$	28	A
I_{CM}	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	150	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 5 \Omega$ Clamped inductive load	$I_{CM} = 60$ @ $0.8 V_{CES}$	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	$^\circ\text{C}$
Maximum Lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$
M_d	Mounting torque (M3.5) (TO-220)	0.55/5Nm/lb.in.	
Weight		4	g

TO-220 (IXGP)



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

Features

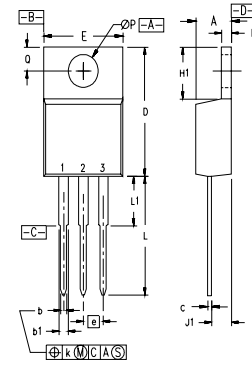
- High Voltage IGBT for resonant power supplies
 - Induction heating
 - Rice cookers
- International standard package JEDEC TO-220
- Low switching losses, low $V_{(sat)}$
- MOS Gate turn-on
 - drive simplicity

Advantages

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

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	2.5		5 V
I_{CES}	$V_{CE} = V_{CES}, V_{GE} = 0 \text{ V}$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$			25 μA 250 μA
I_{GES}	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = 28 \text{ A}, V_{GE} = 15 \text{ V}$ $T_J = 125^\circ\text{C}$	2.9 2.8	3.5	V V

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = 28\text{A}$; $V_{CE} = 10\text{V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$	18	25	S
C_{ies}	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$		2700	pF
C_{oes}			170	pF
C_{res}			60	pF
Q_g	$I_C = 28\text{A}$, $V_{GE} = 15\text{V}$, $V_{CE} = 0.5 V_{CES}$		92	nC
Q_{ge}			15	nC
Q_{gc}			30	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = 28\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 5\ \Omega$		30	ns
t_{ri}			20	ns
$t_{d(off)}$			180	ns
t_{fi}	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 28\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 5\ \Omega$		160	ns
E_{off}			2.0	mJ
$t_{d(on)}$			35	ns
t_{ri}	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 28\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 5\ \Omega$		28	ns
E_{on}			1.4	mJ
$t_{d(off)}$			250	ns
t_{fi}	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 28\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 5\ \Omega$		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

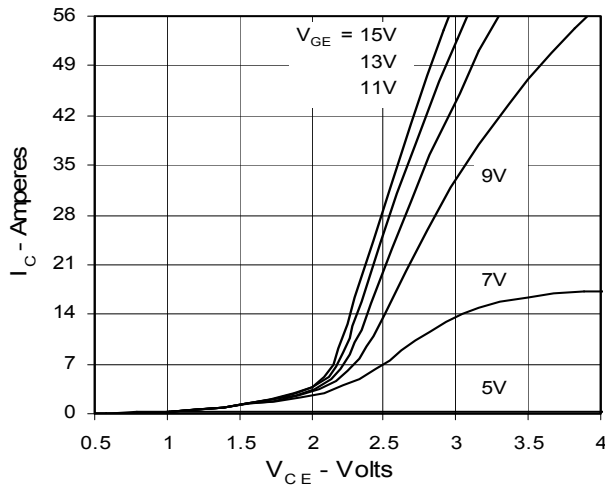
SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70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

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

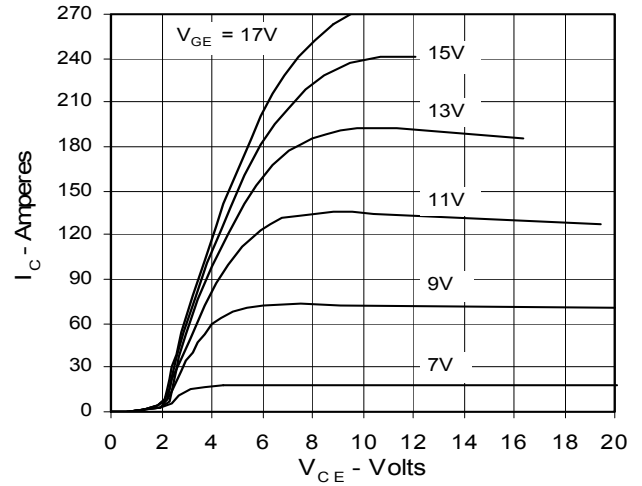
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 6,306,728B1 6,259,123B1 6,306,728B1
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025 6,404,065B1 6,162,665 6,534,343

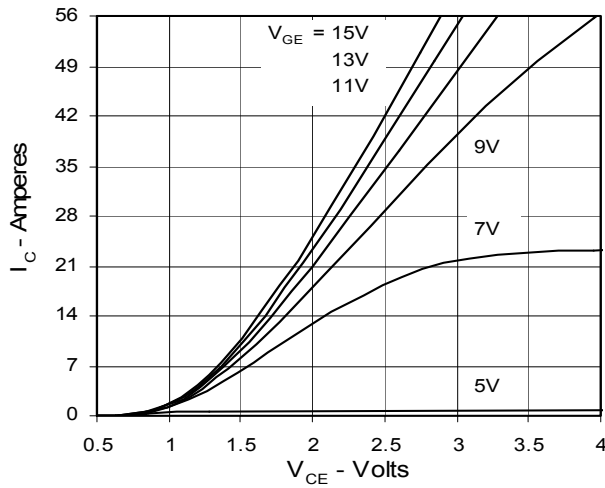
**Fig. 1. Output Characteristics
@ 25 Deg. C**



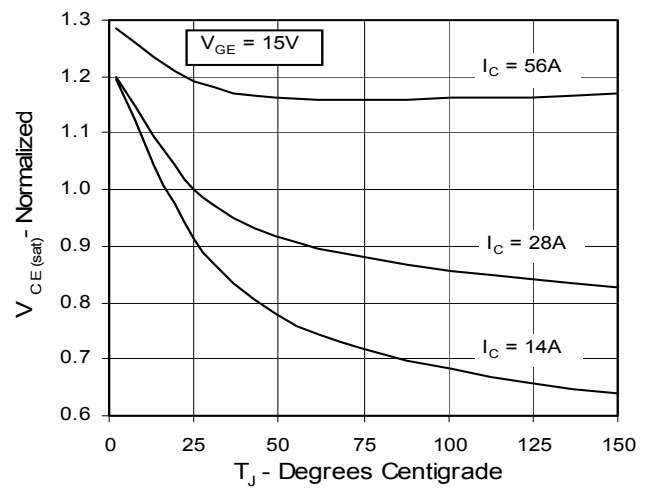
**Fig. 2. Extended Output Characteristics
@ 25 deg. C**



**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**

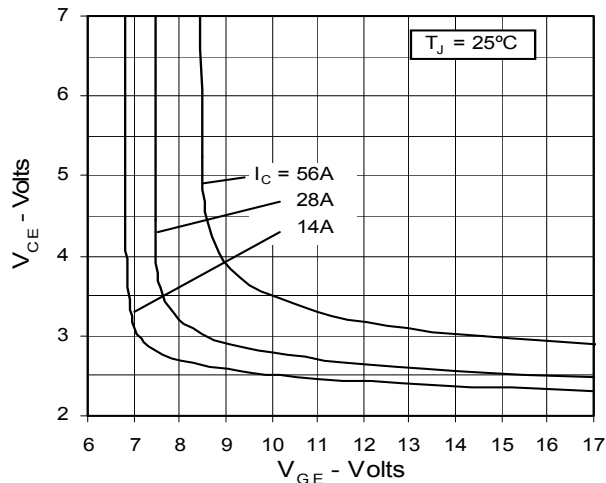


Fig. 6. Input Admittance

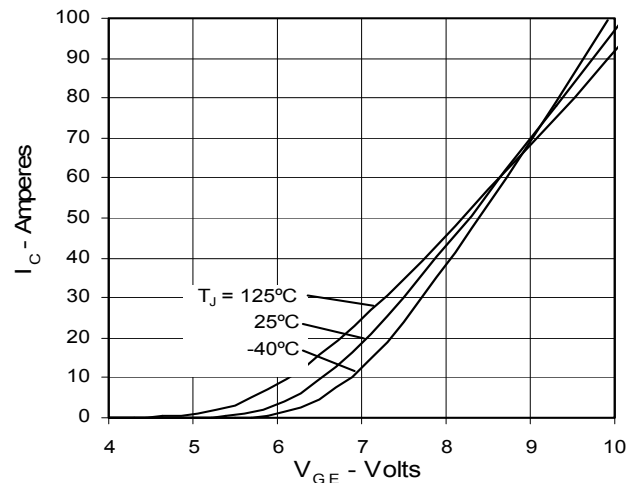


Fig. 7. Transconductance

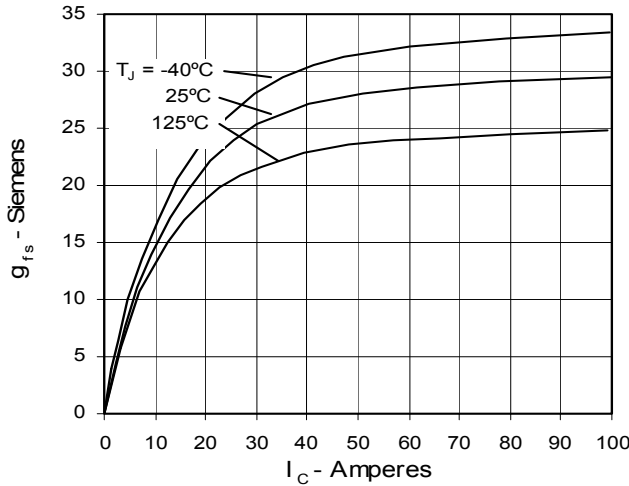


Fig. 8. Dependence of Turn-off Energy Loss on R_G

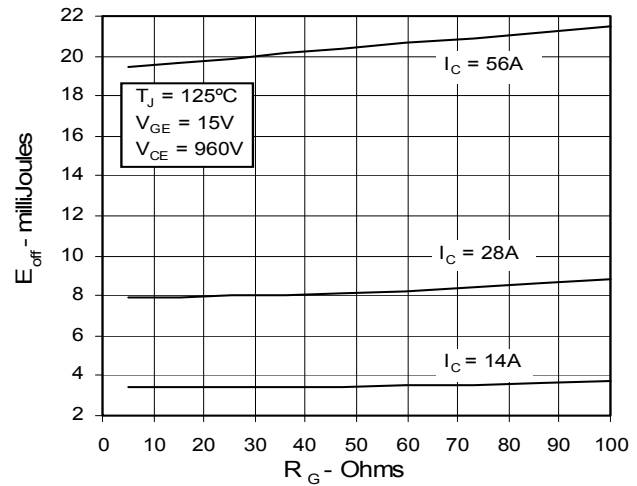


Fig. 9. Dependence of Turn-Off Energy Loss on I_C

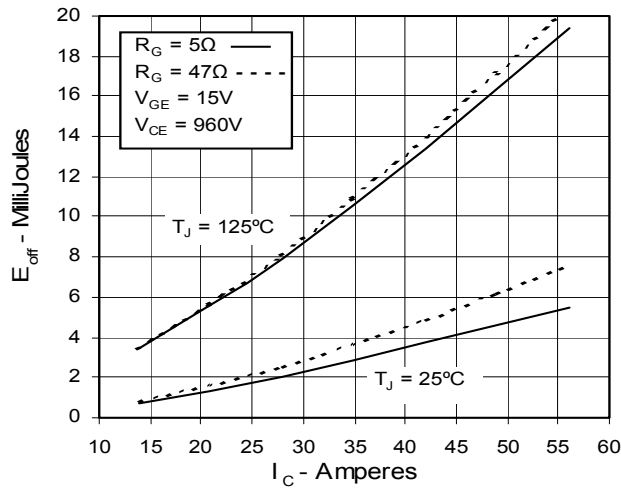


Fig. 10. Dependence of Turn-off Energy Loss on Temperature

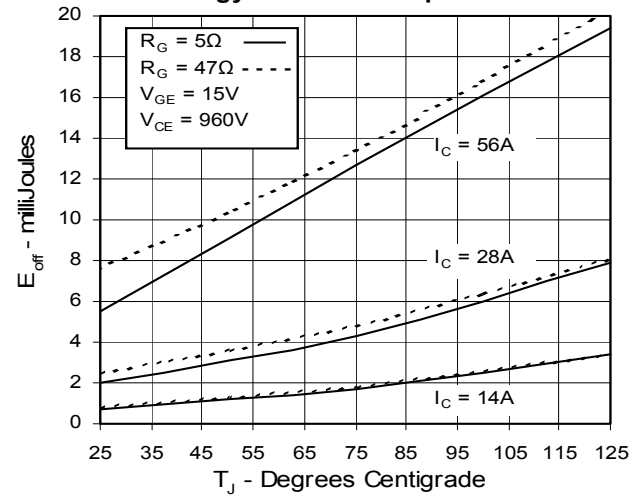


Fig. 11. Dependence of Turn-off Switching Time on R_G

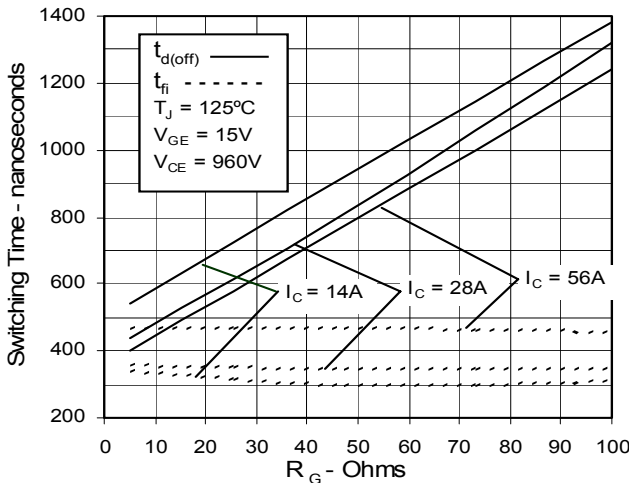


Fig. 12. Dependence of Turn-off Switching Time on I_C

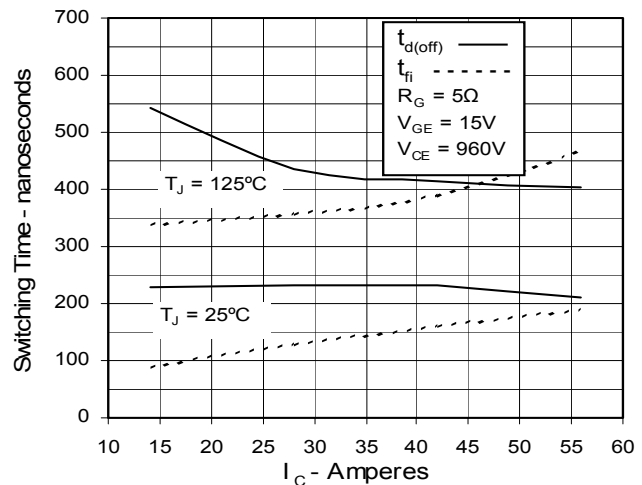


Fig. 13. Dependence of Turn-off Switching Time on Temperature

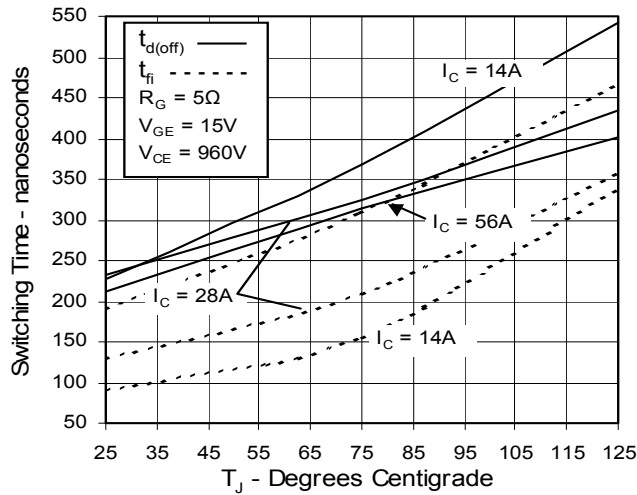


Fig. 14. Gate Charge

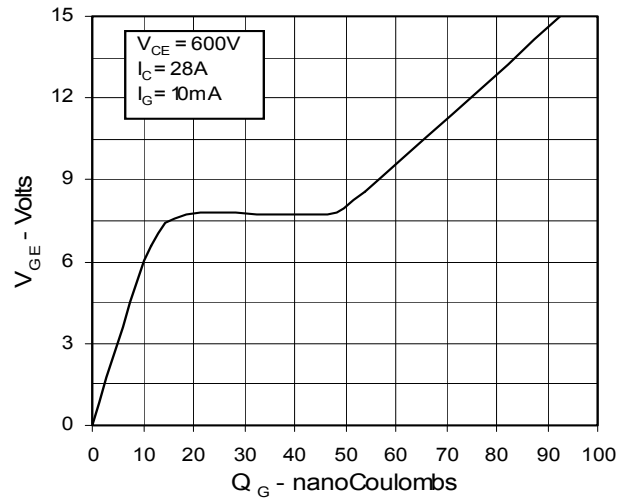


Fig. 15. Capacitance

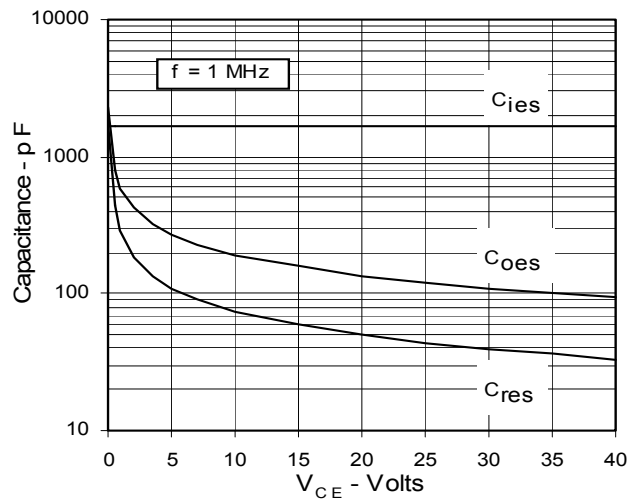


Fig. 16. Maximum Transient Thermal Resistance

