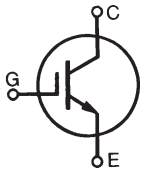
IXYS

Polar™ High Speed IGBT

IXGQ240N30PB

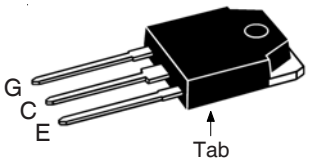
V_{CES} = 300V
I_{CP} = 500A
$V_{CE(sat)}$ ≤ 1.6V

For PDP Applications



Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	300	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C (Chip Capability)	240	A
I_{CP}	$T_J \leq$ 150°C, tp < 10μs	500	A
$I_{C(RMS)}$	Lead Current Limit	75	A
SSOA	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 1Ω	I_{CM} = 240	A
(RBSOA)	Clamped Inductive Load	$V_{CE} \leq V_{CES}$	
P_d	T_C = 25°C	500	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
M_d	Mounting Torque	1.13/10	Nm/lb.in.
Weight		5.5	g

TO-3P



G = Gate C = Collector
E = Emitter Tab = Collector

Features

- Low $V_{CE(sat)}$
  - for Minimum On-State Conduction Losses
- MOS Gate Turn-On
  - Drive Simplicity

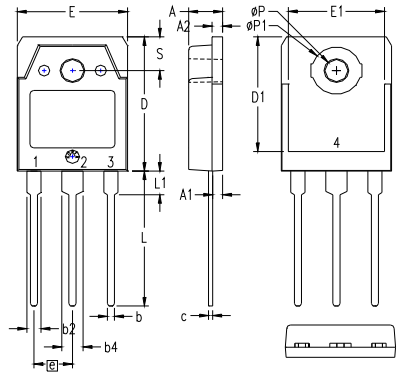
Applications

- PDP Screen Drivers

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	300			V
$V_{GE(th)}$	I_C = 1mA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			1	μA
	T_J = 125°C			200	μA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 120A, V_{GE} = 15V, Note 1		1.35	1.60	V
	T_J = 125°C		1.40		V
	I_C = 240A		1.85		V
	T_J = 125°C		2.10		V

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
g_{fs}	I_C = 120A, V_{CE} = 10V, Note 1	75	130	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		6900	pF
C_{oes}			435	pF
C_{res}			97	pF
Q_g	I_C = 120A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		225	nC
Q_{ge}			37	nC
Q_{gc}			88	nC
$t_{d(on)}$	**Resistive Switching Times, T_J = 25°C**		30	ns
t_r	I_C = 120A, V_{GE} = 15V		70	ns
$t_{d(off)}$	V_{CE} = 0.8 • V_{CES}, R_G = 1Ω		104	ns
t_f			45	ns
$t_{d(on)}$	**Resistive Switching Times, T_J = 125°C**		29	ns
t_r	I_C = 120A, V_{GE} = 15V		104	ns
$t_{d(off)}$	V_{CE} = 0.8 • V_{CES}, R_G = 1Ω		103	ns
t_f			100	ns
R_{thJC}				0.25 °C/W
R_{thCS}			0.21	°C/W

TO-3P (IXGQ) Outline



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

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.193	4.70	4.90
A1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	0.90	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
c	.022	.031	0.55	0.80
D	.780	.791	19.80	20.10
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.50	13.70
e	.215 BSC		5.45 BSC	
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
øP	.126	.134	3.20	3.40
øP1	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

All metal area are tin plated.

Note 1. Pulse test, t ≤ 300µs, duty cycle, d ≤ 2%.

Fig. 1. Output Characteristics @ T_J = 25ºC

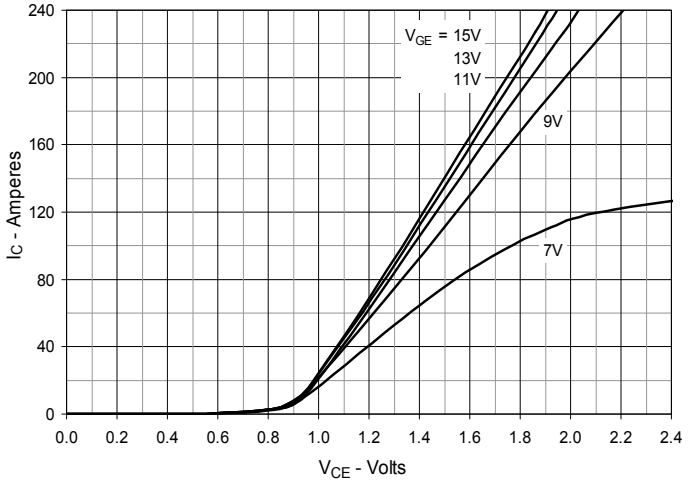


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

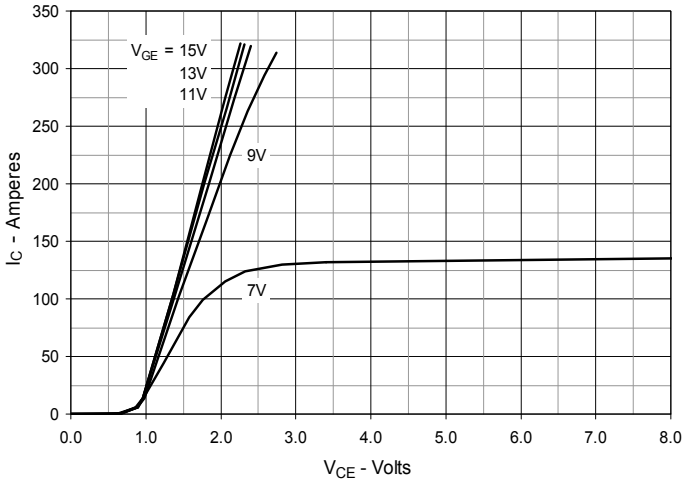


Fig. 3. Output Characteristics @ T_J = 125ºC

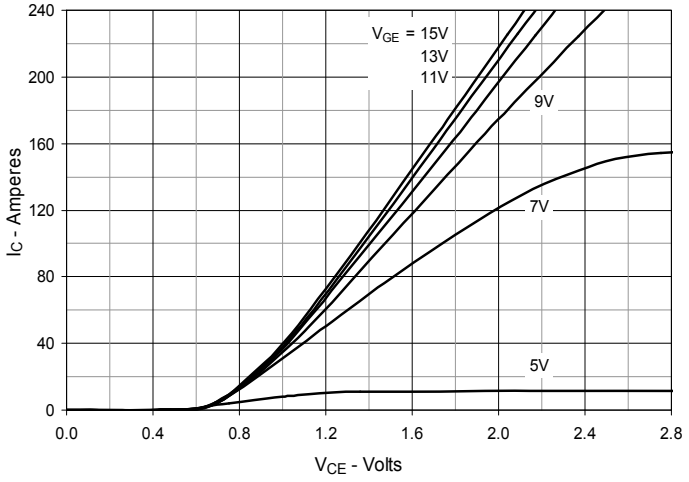


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

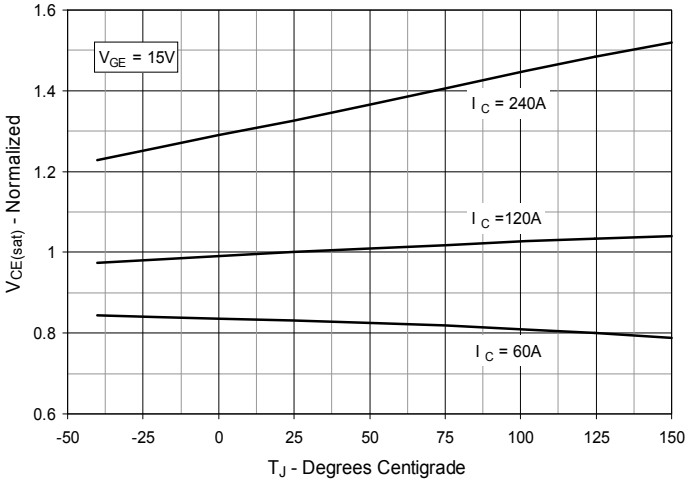


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

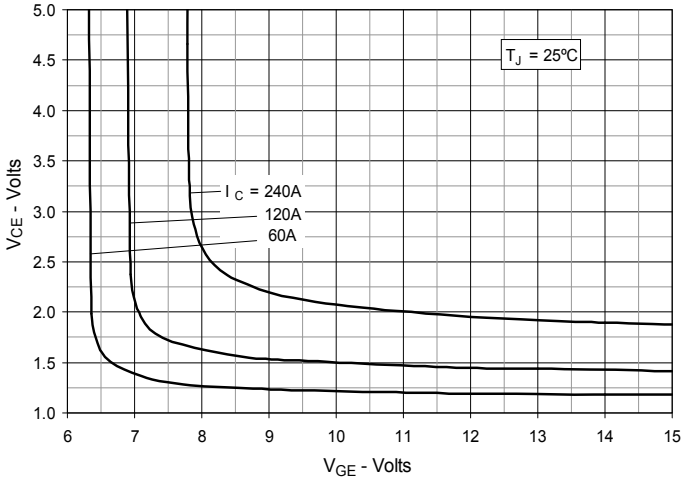


Fig. 6. Input Admittance

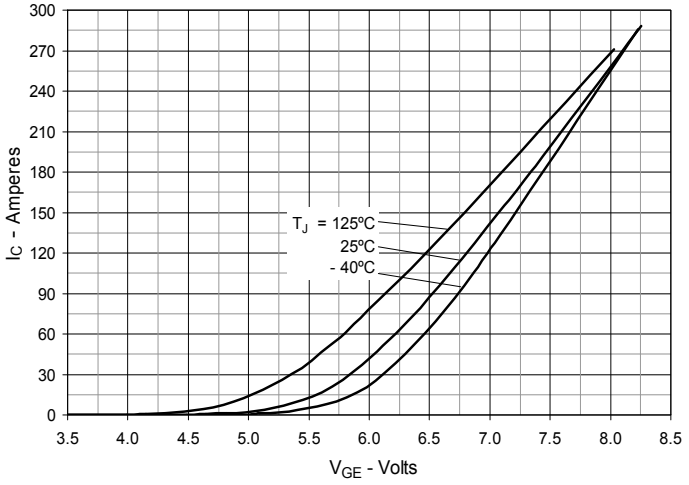


Fig. 7. Transconductance

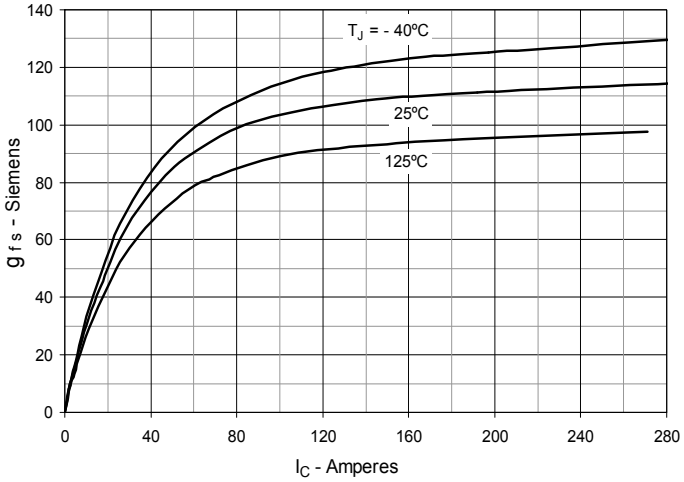


Fig. 8. Gate Charge

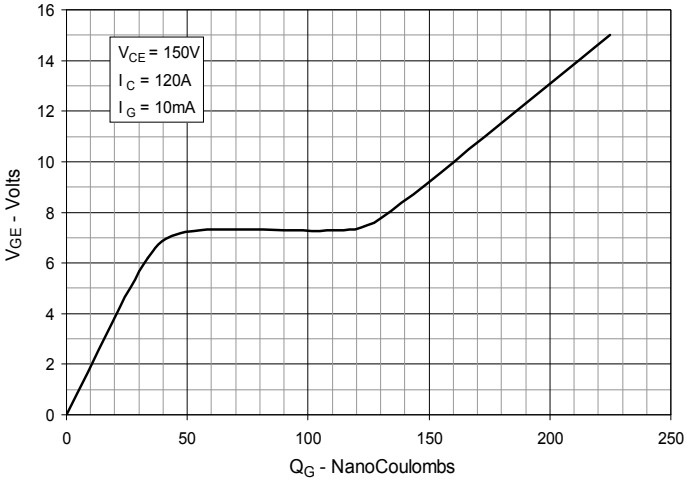


Fig. 9. Reverse-Bias Safe Operating Area

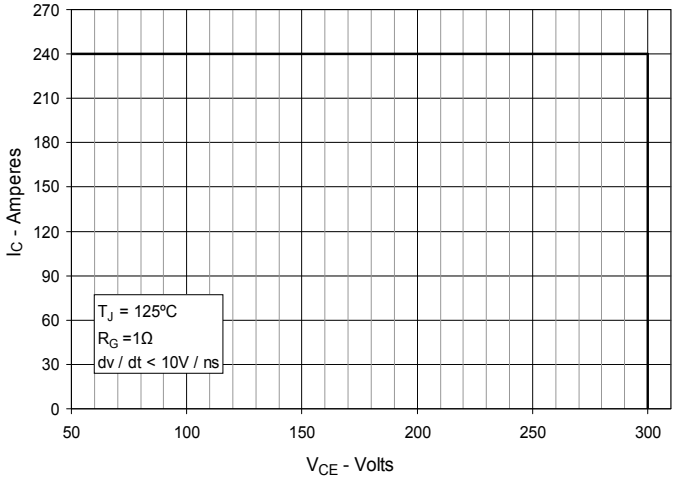


Fig. 10. Capacitance

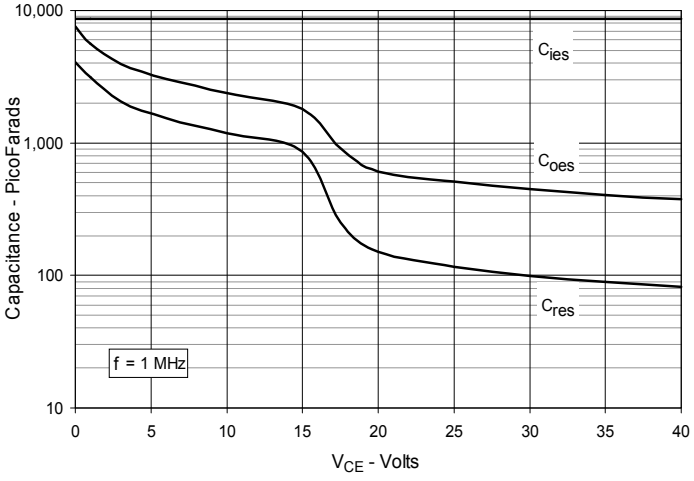


Fig. 11. Forward-Bias Safe Operating Area

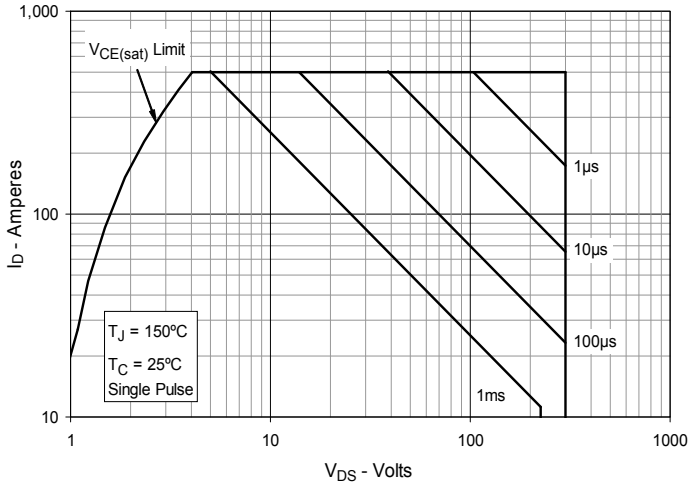


Fig. 12. Maximum Transient Thermal Impedance