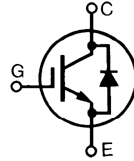
IXYS

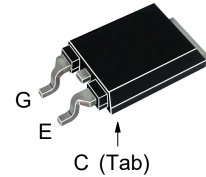
High Voltage, High Gain BIMOSFET™ Monolithic Bipolar MOS Transistor

IXBV22N300S

V_{CES} = 3000V
I_{C110} = 22A
$V_{CE(sat)}$ ≤ 2.7V



PLUS220SMDHV



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

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	3000	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	3000	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	60	A
I_{C110}	T_C = 110°C	22	A
I_{CM}	T_C = 25°C, 1ms	190	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 15Ω Clamped Inductive Load	I_{CM} = 180 V_{CES} ≤ 1500	A V
t_{SC} (SCSOA)	V_{GE} = 15V, T_J = 125°C, R_G = 52Ω, V_{CE} = 1500V, Non-Repetitive	10	μs
P_C	T_C = 25°C	290	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_{SOLD}	Plastic Body for 10s	260	°C
Weight		4	g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	3000			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = 0.8 • V_{CES}, V_{GE} = 0V			25	μA
	T_J = 125°C			1	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V			±100	nA
$V_{CE(sat)}$	I_C = 22A, V_{GE} = 15V, Note 1		2.2	2.7	V
	T_J = 125°C		2.7		V

Features

- High Voltage Package
- High Blocking Voltage
- High Peak Current Capability
- Low Saturation Voltage

Advantages

- Low Gate Drive Requirement
- High Power Density

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- Uninterruptible Power Supplies (UPS)
- Laser Generators
- Capacitor Discharge Circuits
- AC Switches

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IXYS IXBV22N300S

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Min.	Typ.	Max.	
g_{fS}	I_C = 22A, V_{CE} = 10V, Note 1	13	22		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		2200		pF
C_{oes}			85		pF
C_{res}			30		pF
Q_g	I_C = 22A, V_{GE} = 15V, V_{CE} = 1500V		110		nC
Q_{ge}			13		nC
Q_{gc}			45		nC
$t_{d(on)}$	**Resistive Switching Times, T_J = 25°C** I_C = 22A, V_{GE} = 15V V_{CE} = 960V, R_G = 15Ω		46		ns
t_r			360		ns
$t_{d(off)}$			205		ns
t_f			1820		ns
$t_{d(on)}$	**Resistive Switching Times, T_J = 125°C** I_C = 22A, V_{GE} = 15V V_{CE} = 960V, R_G = 15Ω		43		ns
t_r			700		ns
$t_{d(off)}$			220		ns
t_f			1650		ns
R_{thJC}				0.43	°C/W

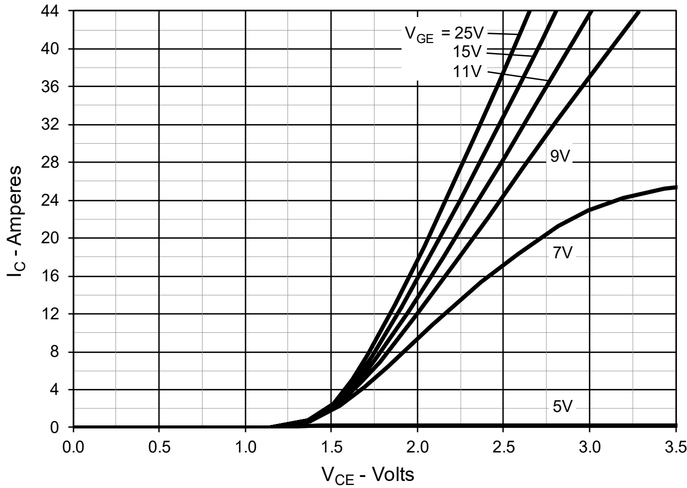
Reverse Diode

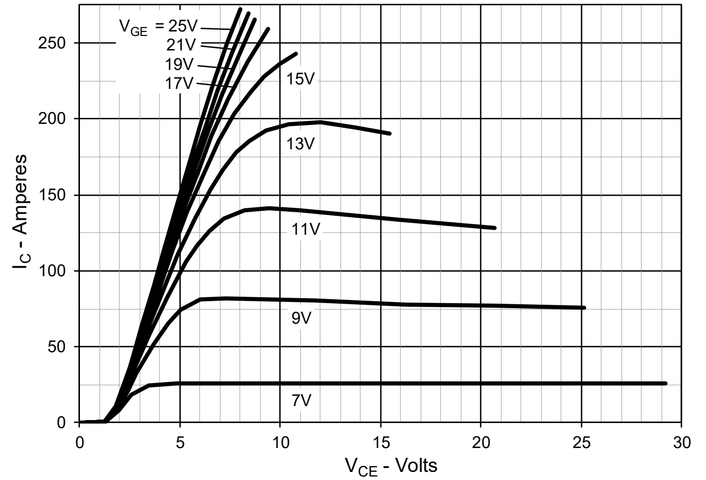
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Min.	Typ.	Max	
V_F	I_F = 22A, V_{GE} = 0V, Note 1			2.7	V
t_{rr}	I_F = 11A, V_{GE} = 0V, -di_F/dt = 100A/μs V_R = 100V, V_{GE} = 0V		1.4		μs
I_{RM}			30		A
Q_{RM}			21		μC

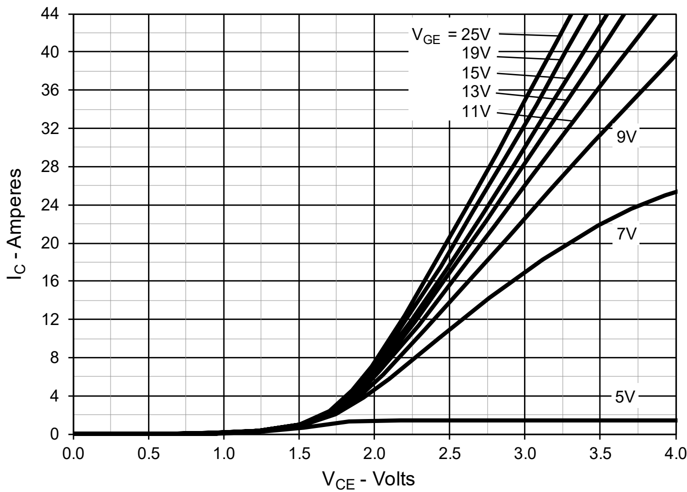
Note: 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.

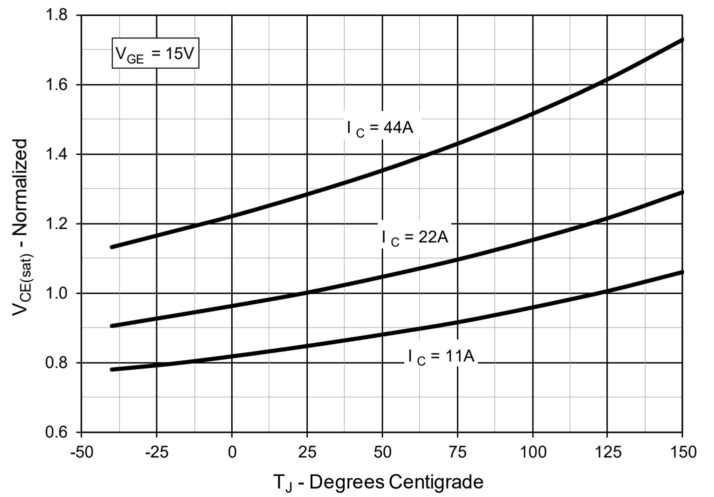
Littelfuse reserves the right to change limits, test conditions and dimensions.

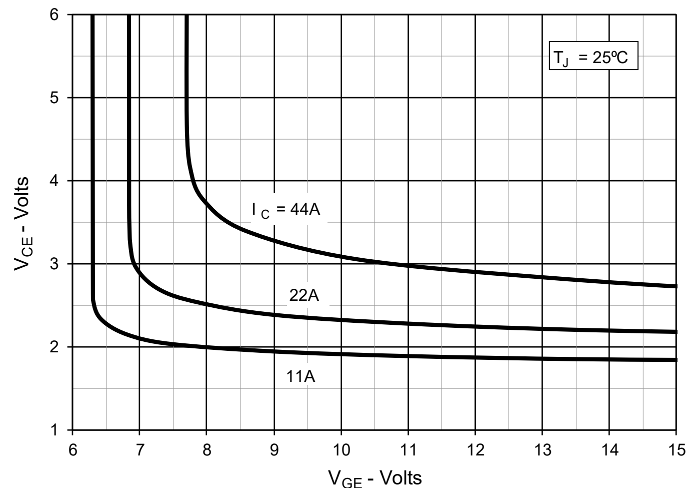
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2 4,860,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2 4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537

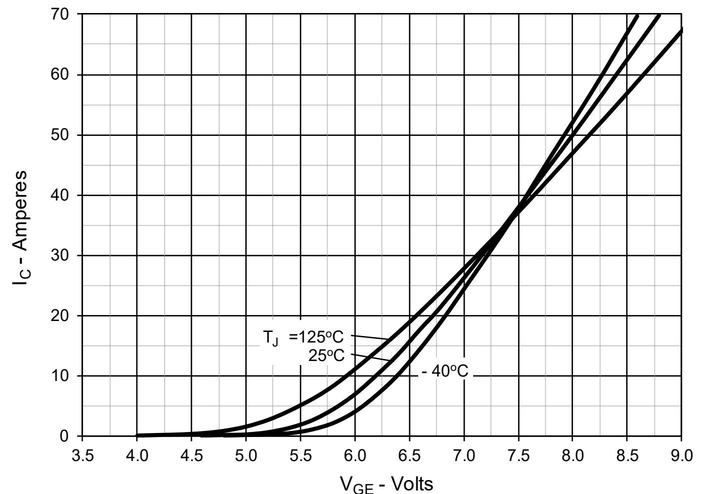












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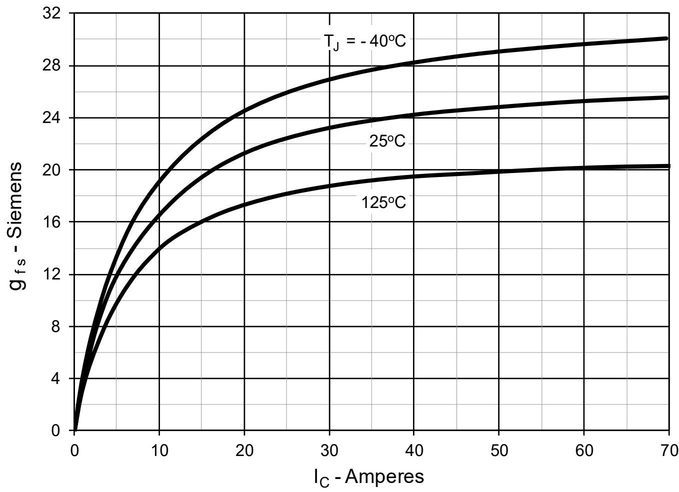


Fig. 7. Transconductance
T_J = - 40ºC
25ºC
125ºC
g f s - Siemens
I_C - Amperes
0 4 8 12 16 20 24 28 32
0 10 20 30 40 50 60 70

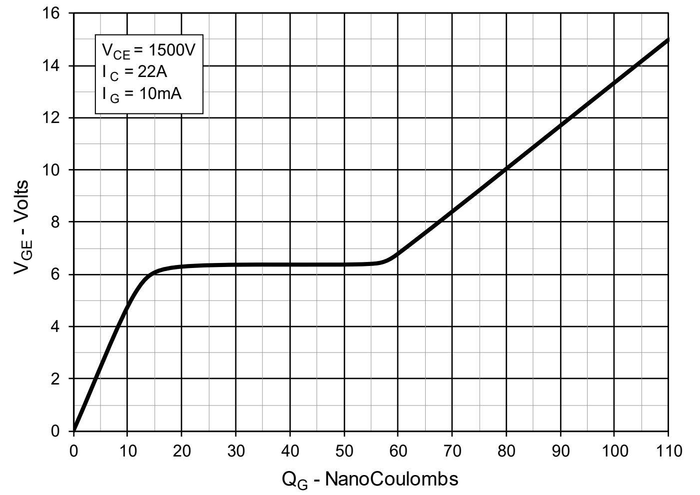


Fig. 8. Gate Charge
V_{CE} = 1500V
I_C = 22A
I_G = 10mA
V_{GE} - Volts
Q_G - NanoCoulombs
0 2 4 6 8 10 12 14 16
0 10 20 30 40 50 60 70 80 90 100 110

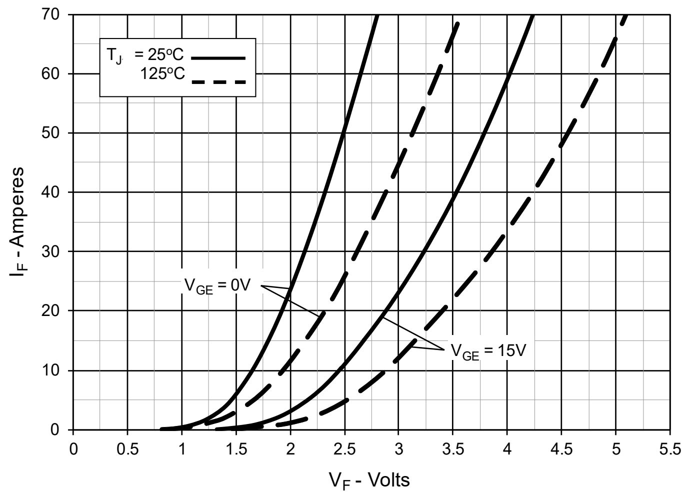


Fig. 9. Forward Voltage Drop of Intrinsic Diode
T_J = 25ºC
125ºC
V_{GE} = 0V
V_{GE} = 15V
I_F - Amperes
V_F - Volts
0 10 20 30 40 50 60 70
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5

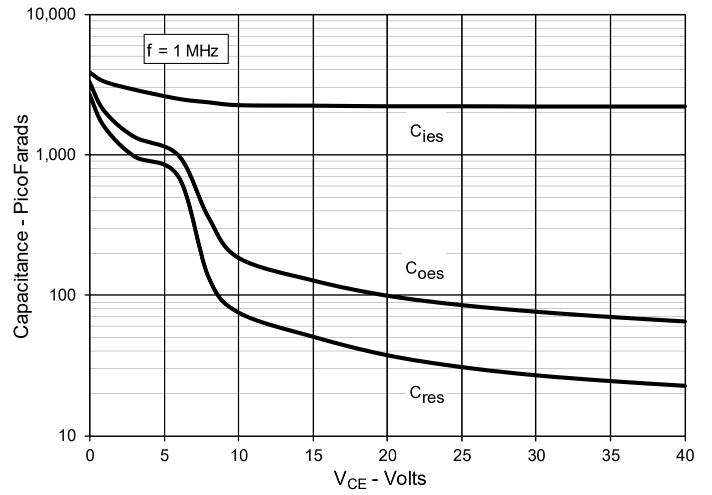


Fig. 10. Capacitance
f = 1 MHz
C_{ies}
C_{oes}
C_{res}
Capacitance - PicoFarads
V_{CE} - Volts
10 100 1,000 10,000
0 5 10 15 20 25 30 35 40

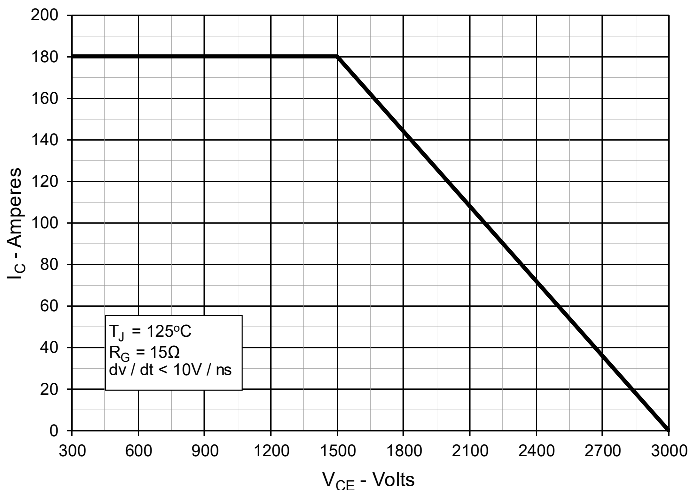


Fig. 11. Reverse-Bias Safe Operating Area
T_J = 125ºC
R_G = 15Ω
dv / dt < 10V / ns
I_C - Amperes
V_{CE} - Volts
0 20 40 60 80 100 120 140 160 180 200
300 600 900 1200 1500 1800 2100 2400 2700 3000

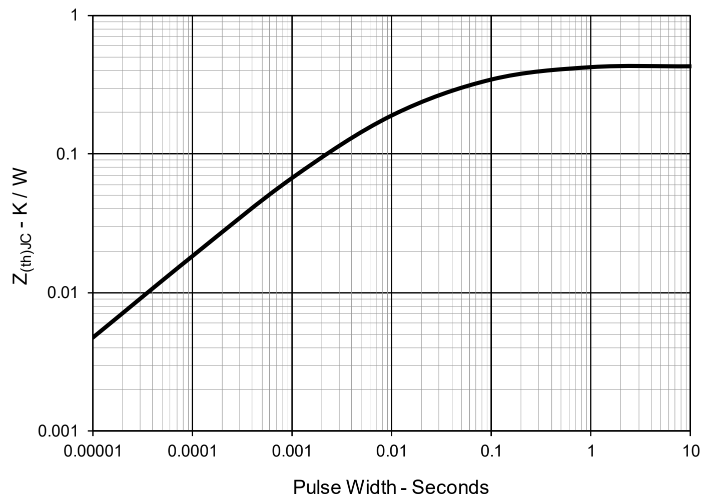
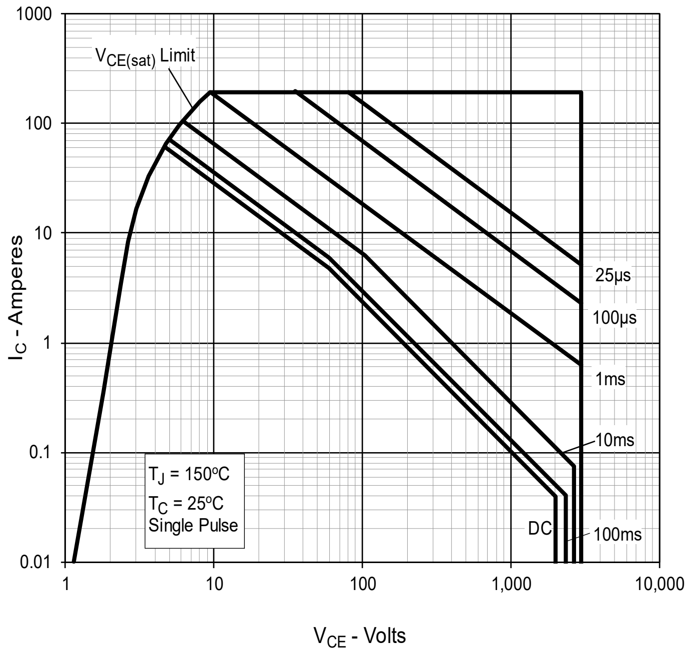
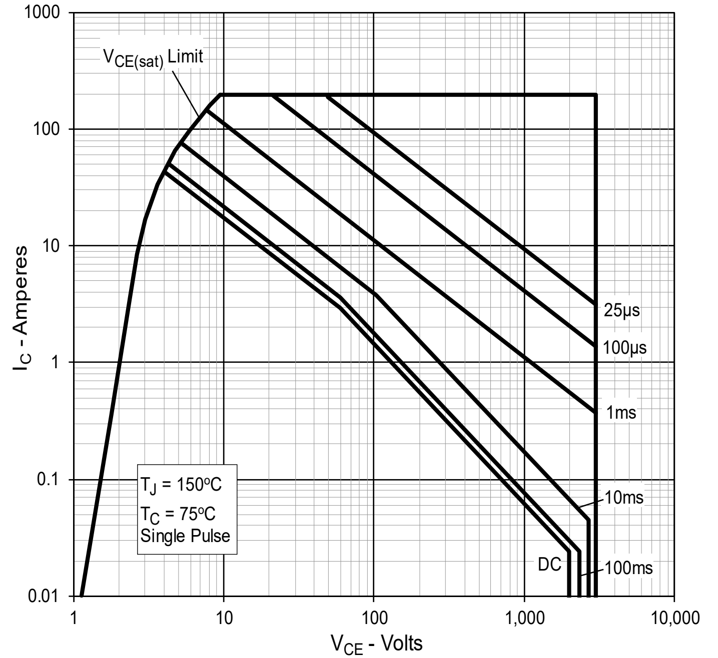


Fig. 12. Maximum Transient Thermal Impedance
$Z_{(th)JC}$ - K / W
Pulse Width - Seconds
0.001 0.01 0.1 1
0.00001 0.0001 0.001 0.01 0.1 1 10





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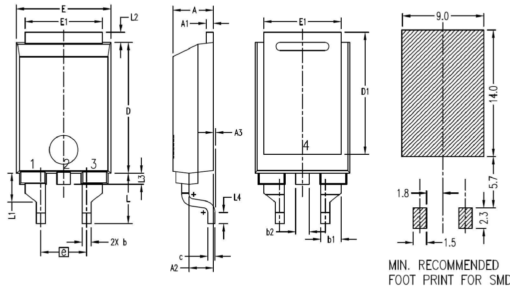
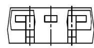
PLUS220SMDHV (IXBV_S) Outline





1 - Gate
2,4 - Collector
3 - Emitter

SYM	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	.169	.185	4.30	4.70
A1	.028	.035	0.70	0.90
A2	.098	.118	2.50	3.00
A3	.000	.010	0.00	0.25
b	.035	.047	0.90	1.20
b1	.080	.095	2.03	2.41
b2	.054	.064	1.37	1.63
c	.028	.035	0.70	0.90
D	.551	.591	14.00	15.00
D1	.512	.539	13.00	13.70
E	.394	.433	10.00	11.00
E1	.331	.346	8.40	8.80
e	.200 BSC		5.08 BSC	
L	.209	.228	5.30	5.80
L1	.118	.138	3.00	3.50
L2	.035	.051	0.90	1.30
L3	.045	.053	1.25	1.35
L4	.039	.059	1.00	1.50

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