IXYS

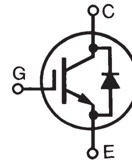
Advance Technical Information

High Voltage, High Gain BIMOSFET™ Monolithic Bipolar MOS Transistor

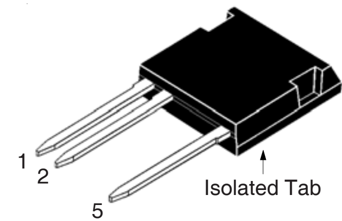
IXBF28N300

V_{CES} = 3000V
I_{C90} = 28A
$V_{CE(sat)}$ ≤ 2.7V

(Electrically Isolated Tab)



ISOPLUS i4-Pak™



1 = Gate 5 = Collector
2 = Emitter

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	50	A
I_{C90}	T_C = 90°C	28	A
I_{CM}	T_C = 25°C, 1ms	220	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 15Ω Clamped Inductive Load	I_{CM} = 220 V_{CE} ≤ 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	216	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}	Plastic Body for 10s	260	°C
F_C	Mounting Force	20..120 / 4.5..27	N/lb.
V_{ISOL}	50/60Hz, 5 Seconds	4000	V~
Weight		5	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} = V_{CES}, V_{GE} = 0V			35	μA
	Note 2, T_J = 125°C			1.5	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V			±200	nA
$V_{CE(sat)}$	I_C = 28A, V_{GE} = 15V, Note 1		2.3	2.7	V
	T_J = 125°C		2.8		V

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 4000V~ Electrical Isolation
- 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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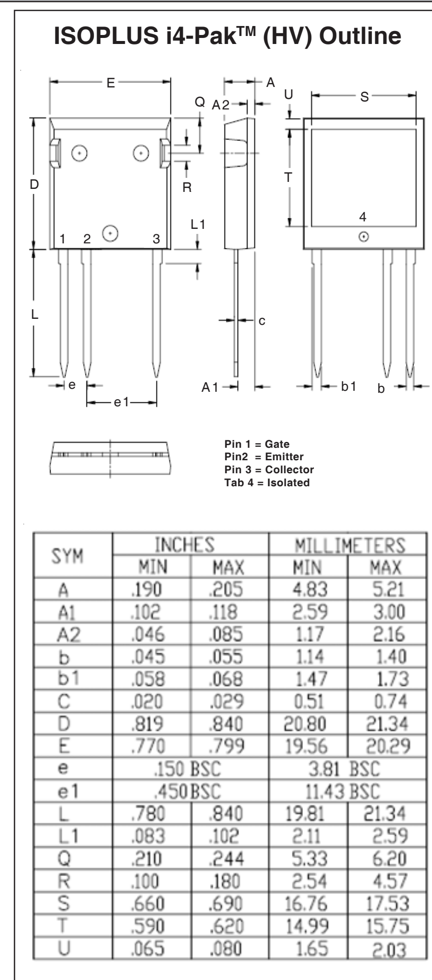
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Min.	Typ.	Max.	Unit
g_{fS}	I_C = 28A, V_{CE} = 10V, Note 1	14	24		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		2370		pF
C_{oes}			87		pF
C_{res}			30		pF
Q_g	I_C = 28A, V_{GE} = 15V, V_{CE} = 1500V		110		nC
Q_{ge}			14		nC
Q_{gc}			50		nC
$t_{d(on)}$	**Resistive Switching Times, T_J = 25°C** I_C = 28A, V_{GE} = 15V V_{CE} = 960V, R_G = 10Ω		50		ns
t_r			412		ns
$t_{d(off)}$			125		ns
t_f			3660		ns
$t_{d(on)}$	**Resistive Switching Times, T_J = 125°C** I_C = 28A, V_{GE} = 15V V_{CE} = 960V, R_G = 10Ω		74		ns
t_r			805		ns
$t_{d(off)}$			245		ns
t_f			3280		ns
R_{thJC}				0.58	°C/W
R_{thCS}			0.15		°C/W

ISOPLUS i4-Pak™ (HV) Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.190	.205	4.83	5.21
A1	.102	.118	2.59	3.00
A2	.046	.085	1.17	2.16
b	.045	.055	1.14	1.40
b1	.058	.068	1.47	1.73
C	.020	.029	0.51	0.74
D	.819	.840	20.80	21.34
E	.770	.799	19.56	20.29
e	.150 BSC		3.81 BSC	
e1	.450BSC		11.43 BSC	
L	.780	.840	19.81	21.34
L1	.083	.102	2.11	2.59
Q	.210	.244	5.33	6.20
R	.100	.180	2.54	4.57
S	.660	.690	16.76	17.53
T	.590	.620	14.99	15.75
U	.065	.080	1.65	2.03

Reverse Diode

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Min.	Typ.	Max	Unit
V_F	I_F = 28A, V_{GE} = 0V, Note 1			2.7	V
t_{rr}	I_F = 14A, V_{GE} = 0V, -di_F/dt = 100A/μs V_R = 100V, V_{GE} = 0V		1.5		μs
I_{RM}			31.0		A
Q_{RM}			22.5		μC

Notes:

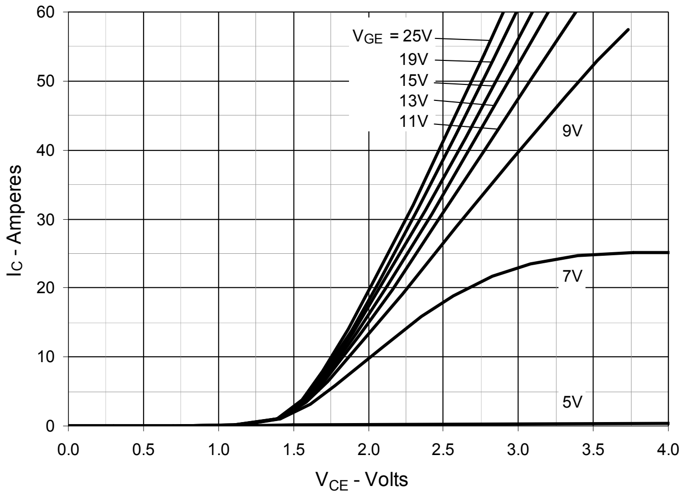
1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.
2. Device must be heatsunk for high-temperature leakage current measurements to avoid thermal runaway.

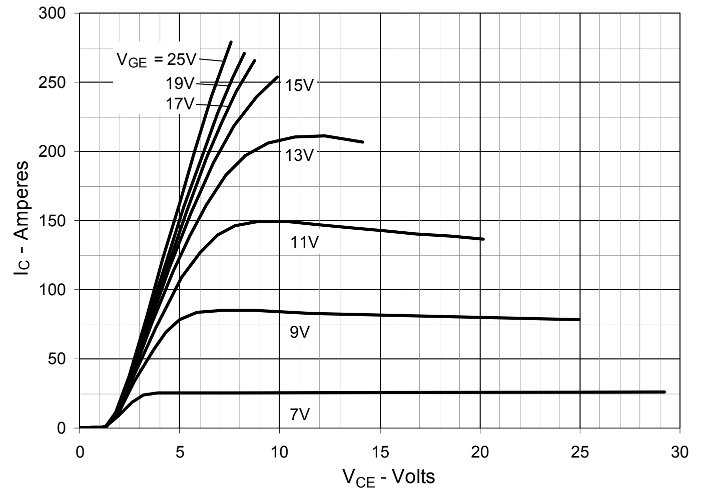
ADVANCE TECHNICAL INFORMATION

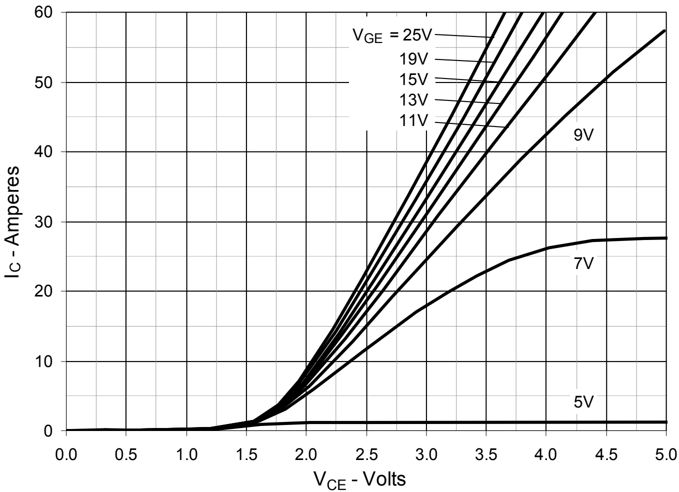
The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

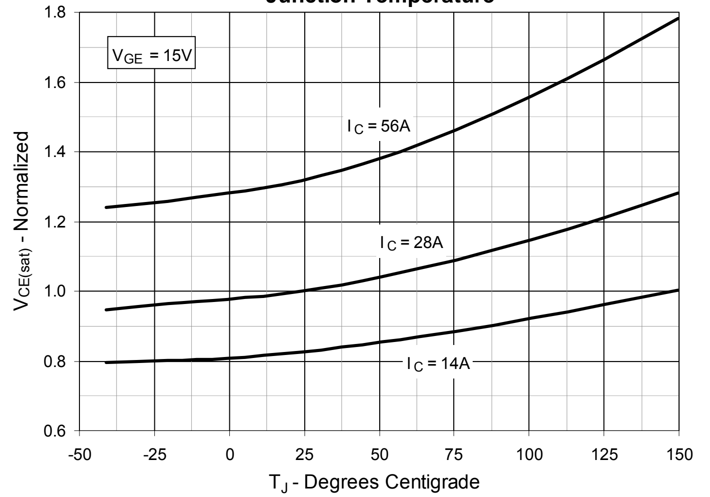
IXYS Reserves the Right to Change Limits, Test Conditions and Dimensions.

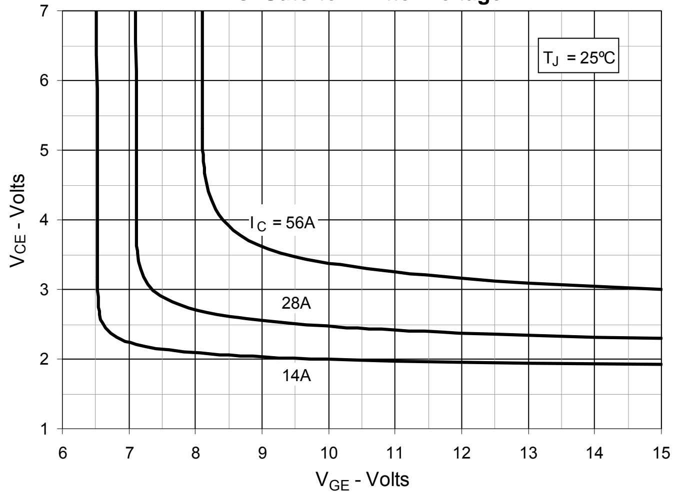
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2 4,860,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2 4,881,106 5,034,796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











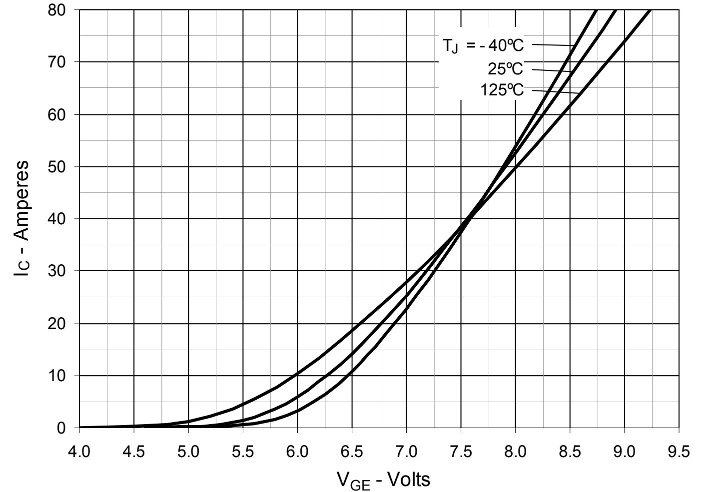


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Fig. 7. Transconductance

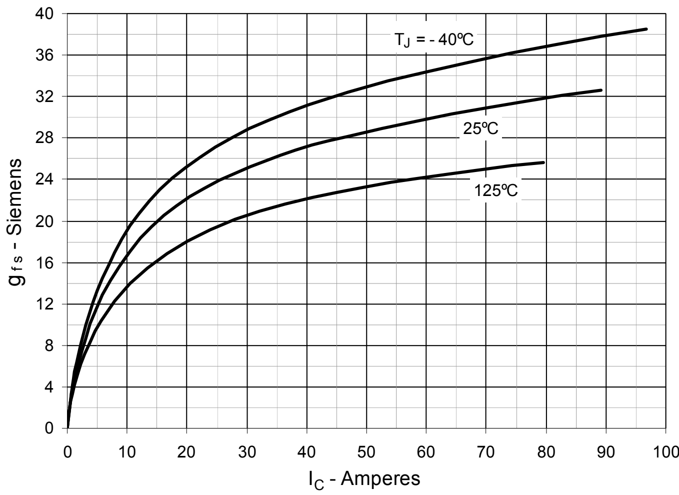

Fig. 8. Gate Charge

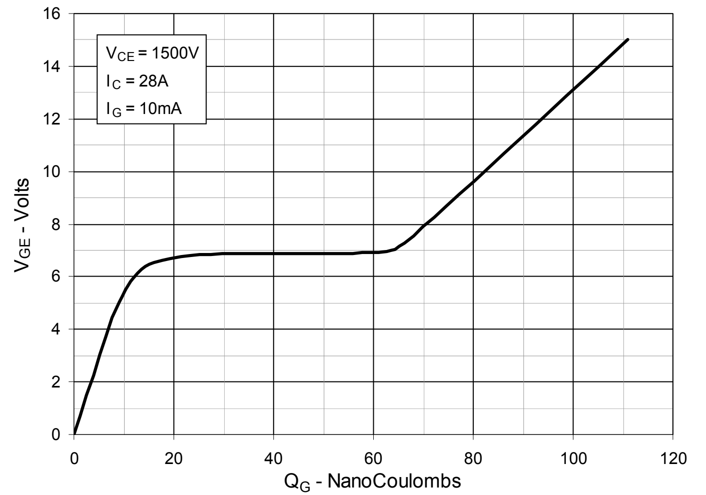

Fig. 9. Forward Voltage Drop of Intrinsic Diode

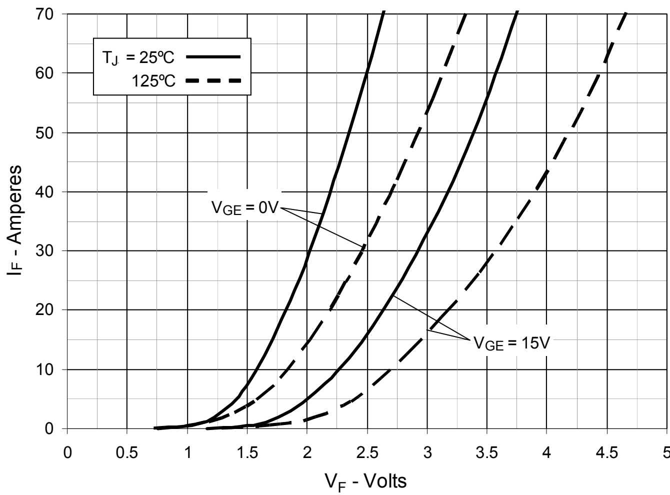

Fig. 10. Capacitance

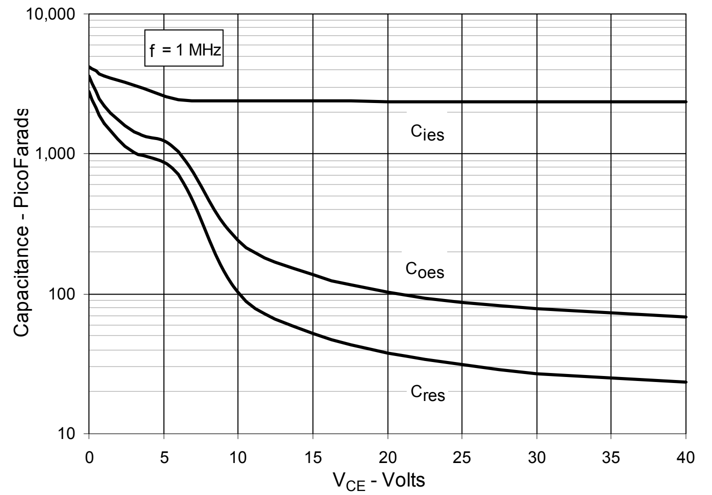

Fig. 11. Reverse-Bias Safe Operating Area

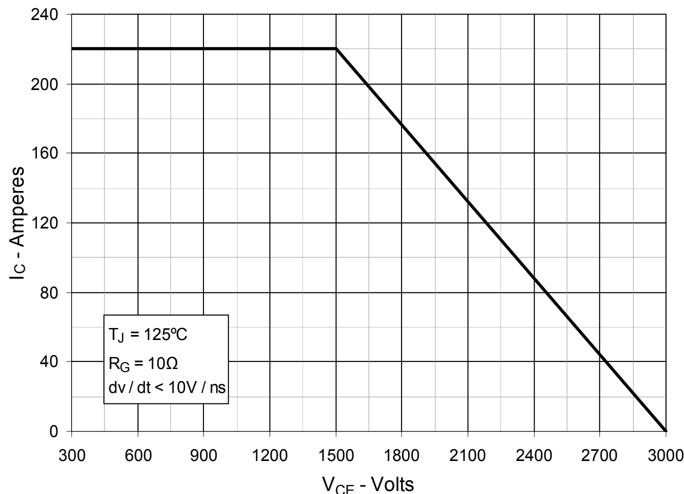

Fig. 12. Maximum Transient Thermal Impedance

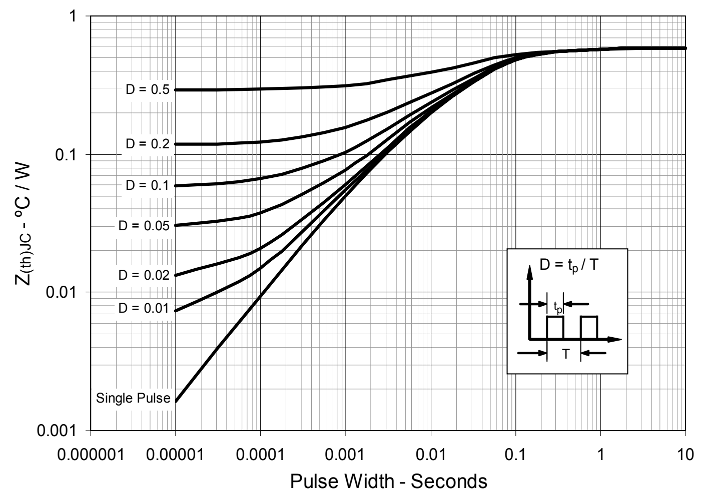

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Fig. 13. Forward-Bias Safe Operating Area @ T_C = 25ºC

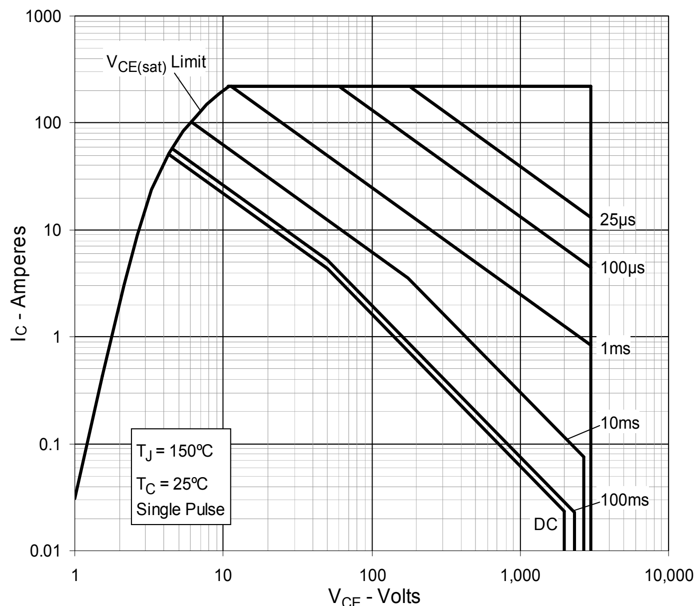
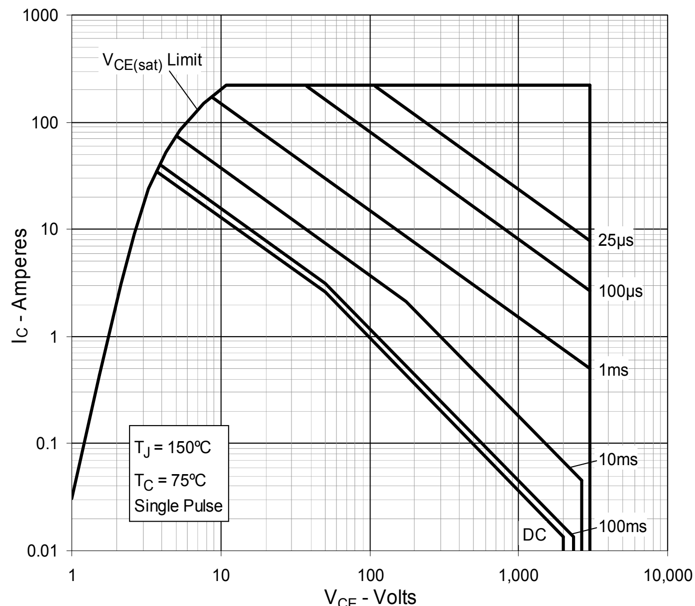


Fig. 14. Forward-Bias Safe Operating Area @ T_C = 75ºC



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