IXYS

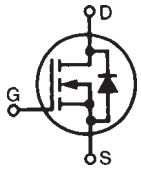
Advance Technical Information

GigaMOS™ HiperFET™ Power MOSFET

IXFZ140N25T

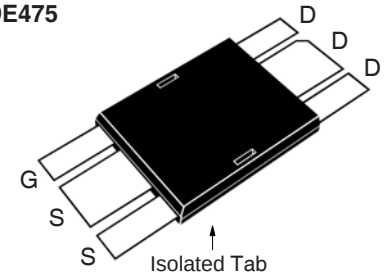
V_{DSS} = 250V
I_{D25} = 100A
$R_{DS(on)}$ ≤ 17mΩ
t_{rr} ≤ 200ns

(Electrically Isolated Tab)



N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

DE475



G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	250	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	250	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	100	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	400	A
I_A	T_C = 25°C	40	A
E_{AS}	T_C = 25°C	3	J
P_D	T_C = 25°C	445	W
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$	20	V/ns
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
V_{ISOL}	50/60 Hz, RMS t = 1 minute	2500	V~
	$I_{ISOL} \le$ 1mA t = 1 second	3000	V~
T_L	1.6mm (0.062 in.) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
F_C	Mounting Force	20..120 / 4.5..27	N/lb.
Weight		3	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 3mA	250			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 4mA	2.5		5.0	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			50	μA
	T_J = 125°C			3	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 60A, Note 1			17	mΩ

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Substrate
  - Excellent Thermal Transfer
  - Increased Temperature and Power Cycling Capability
  - High Isolation Voltage (2500V~)
- Very High Current Handling Capability
- Fast Intrinsic Diode
- Avalanche Rated

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- DC-DC Converters
- Battery Chargers
- Switch-Mode and Resonant-Mode Power Supplies
- DC Choppers
- AC Motor Drives
- Uninterruptible Power Supplies
- High Speed Power Switching Applications

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	80	135		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		19		nF
C_{oss}			1500		pF
C_{rss}			185		pF
$t_{d(on)}$	**Resistive Switching Times** V_{GS} = 15V, V_{DS} = 0.5 • V_{DSS}, I_D = 70A R_G = 1Ω (External)		33		ns
t_r			29		ns
$t_{d(off)}$			92		ns
t_f			22		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 70A		255		nC
Q_{gs}			90		nC
Q_{gd}			62		nC
R_{thJC}				0.28	°C/W
R_{thCS}			0.15		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			140	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			560	A
V_{SD}	I_F = 60A, V_{GS} = 0V, Note 1			1.3	V
t_{rr}	I_F = 70A, V_{GS} = 0V			200	ns
I_{RM}	-di/dt = 100A/μs		9.3		A
Q_{RM}	V_R = 75V		600		nC

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

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.

Fig. 1. Output Characteristics @ T_J = 25ºC

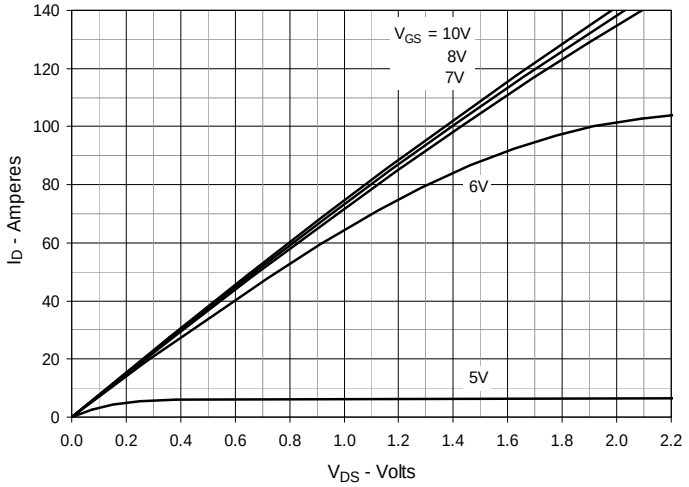


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

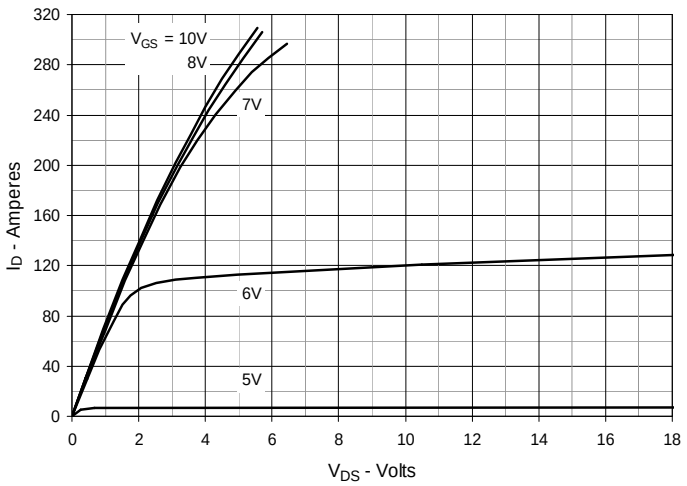


Fig. 3. Output Characteristics @ T_J = 125ºC

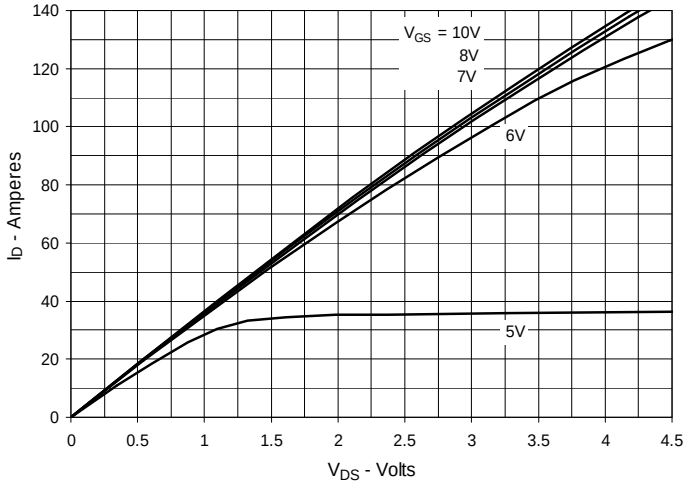


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 70A Value vs. Junction Temperature

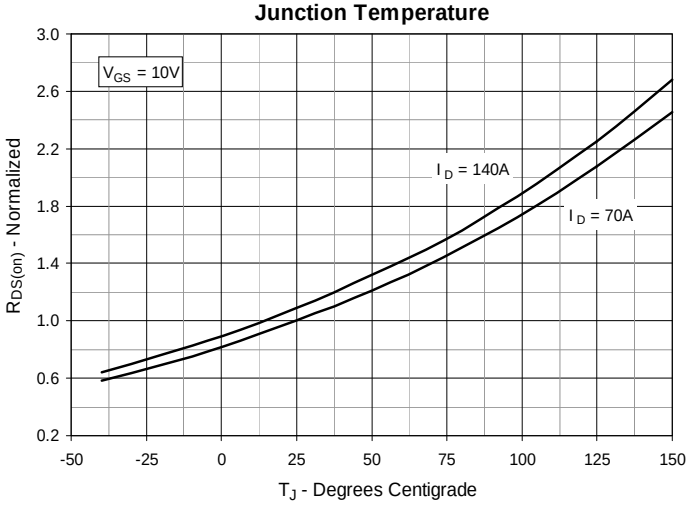


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 70A Value vs. Drain Current

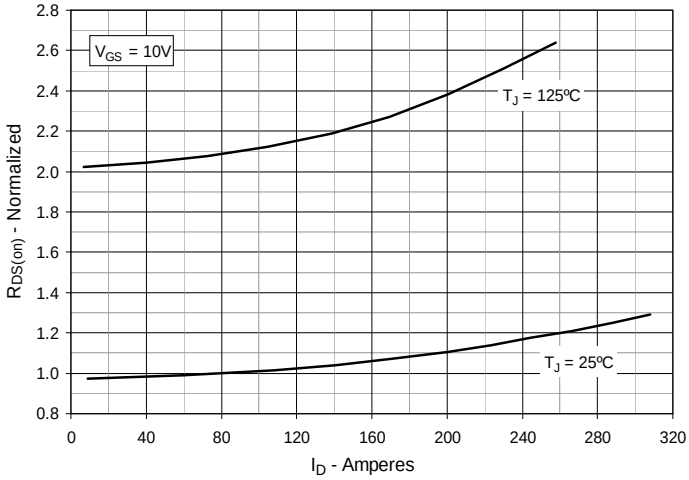


Fig. 6. Maximum Drain Current vs. Case Temperature

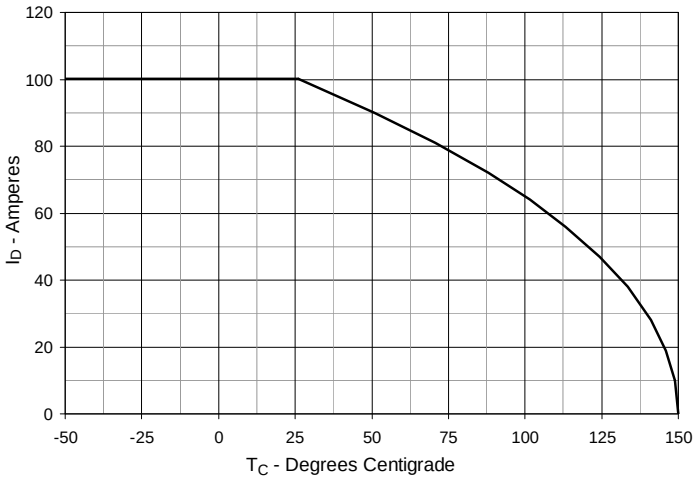


Fig. 7. Input Admittance

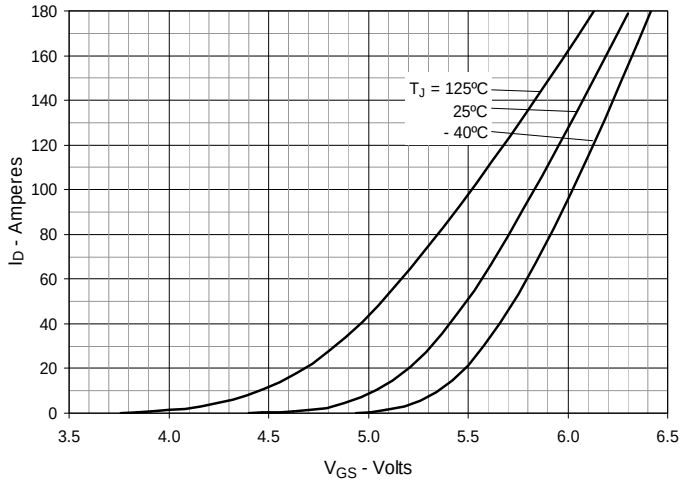


Fig. 8. Transconductance

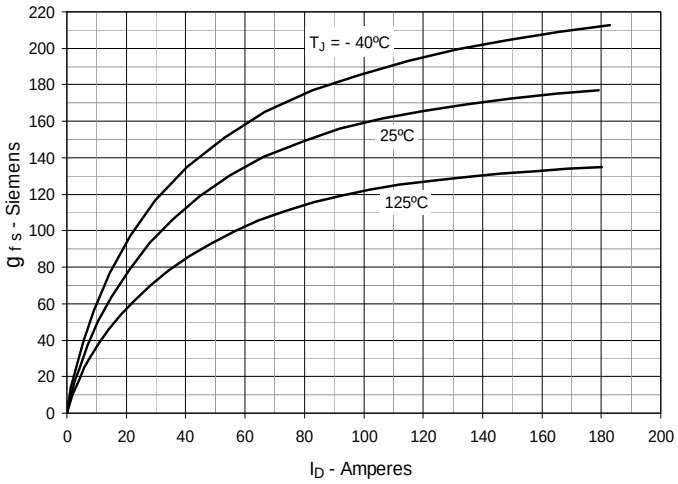


Fig. 9. Forward Voltage Drop of Intrinsic Diode

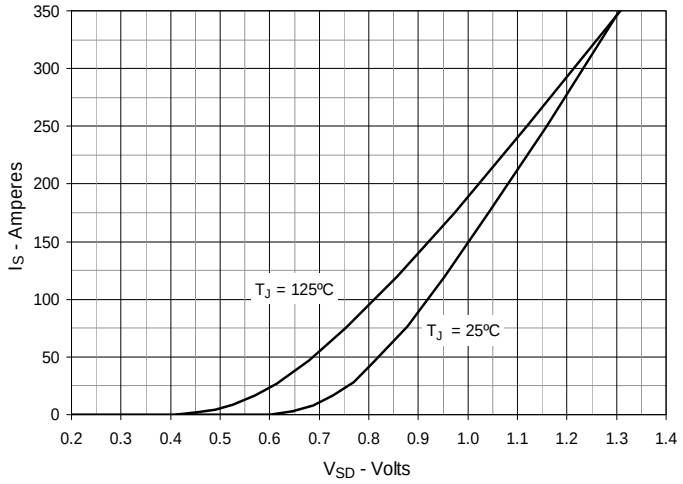


Fig. 10. Gate Charge

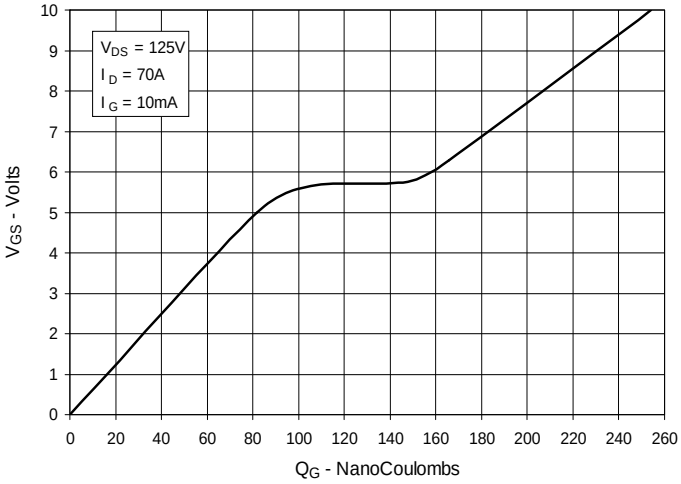


Fig. 11. Capacitance

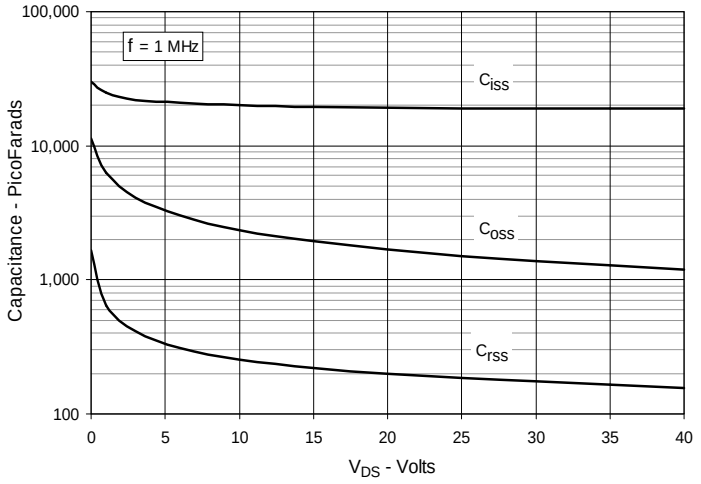


Fig. 12. Forward-Bias Safe Operating Area

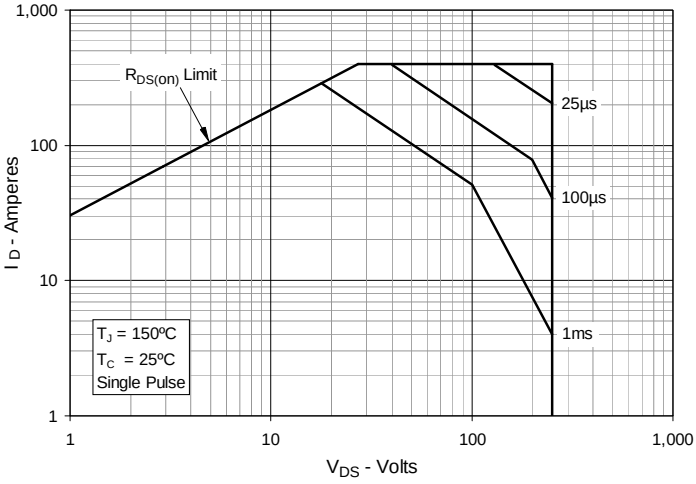
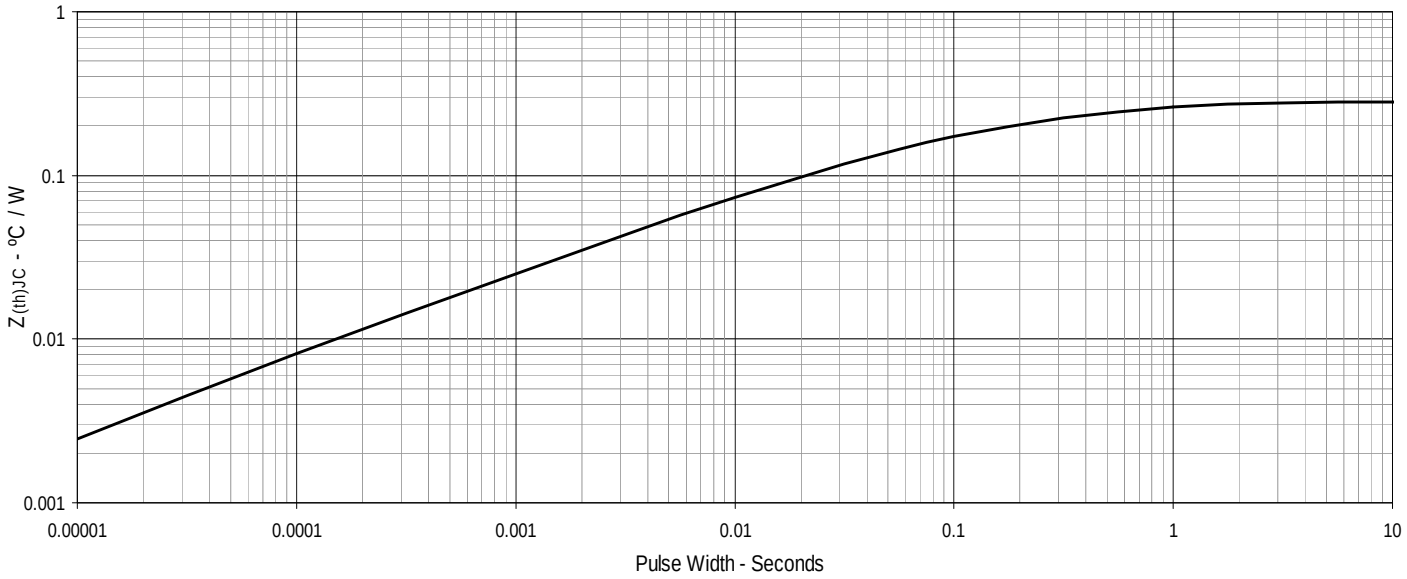
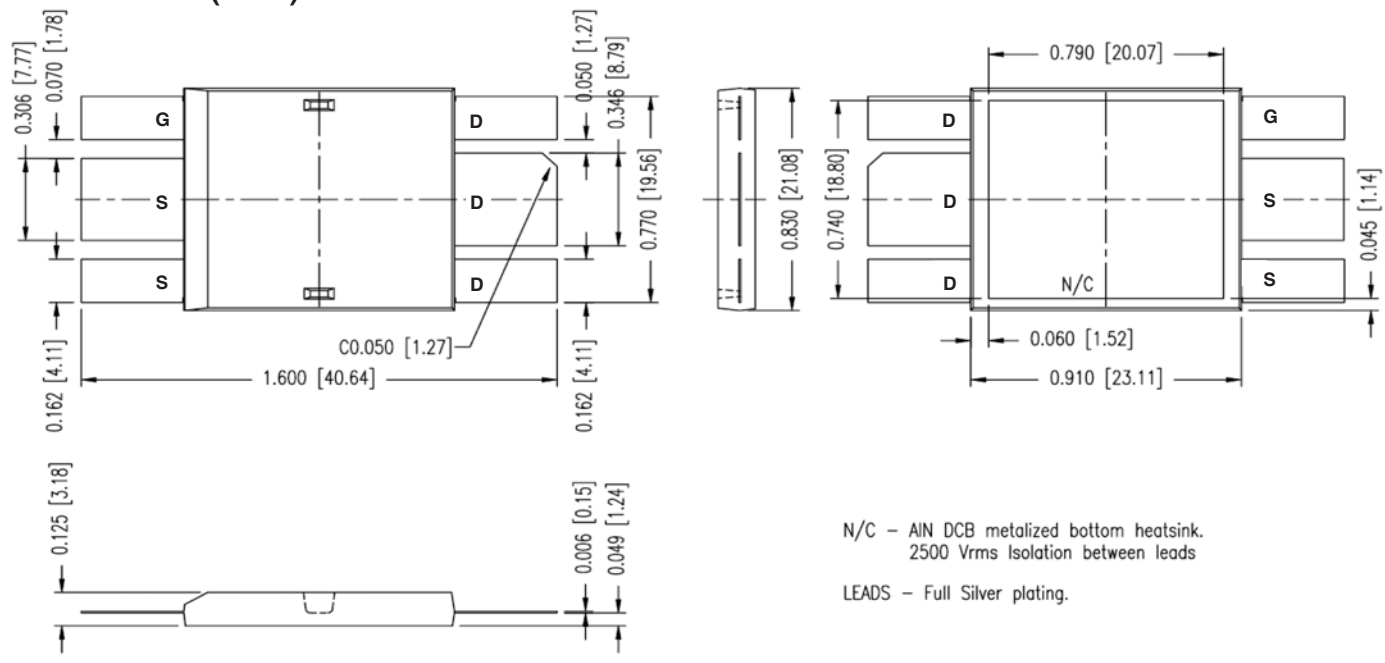


Fig. 13. Maximum Transient Thermal Impedance



DE475 (IXFZ) Outline



N/C – AlN DCB metalized bottom heatsink.
2500 Vrms Isolation between leads

LEADS – Full Silver plating.

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