IXYS

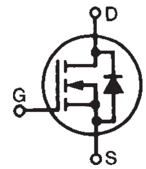
Preliminary Technical Information

TrenchT2™ Power MOSFET

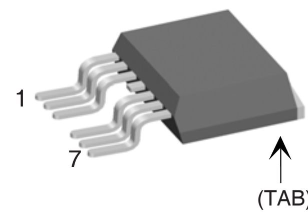
IXTA260N055T2-7

V_{DSS} = 55V
I_{D25} = 260A
$R_{DS(on)}$ ≤ 3.3mΩ

N-Channel Enhancement Mode
Avalanche Rated



TO-263 (7-lead)



Pins: 1 - Gate
2, 3 - Source
5,6,7 - Source
TAB (8) - Drain

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C	55	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ	55	V
V_{GSM}	Transient	± 20	V
I_{D25}	T_C = 25°C	260	A
I_{LRMS}	Lead Current Limit, RMS	160	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	780	A
I_A	T_C = 25°C	100	A
E_{AS}	T_C = 25°C	600	mJ
P_D	T_C = 25°C	480	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_L	1.6mm (0.062in.) from case for 10s	300	°C
T_{sold}	Plastic body for 10 seconds	260	°C
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 = 250μA	55			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0		4.0	V
I_{GSS}	V_{GS} = ± 20V, V_{DS} = 0V			±200	nA
I_{DSS}	V_{DS} = V_{DSS}			5	μA
	V_{GS} = 0V T_J = 150°C			150	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 50A, Notes 1, 2			3.3	mΩ

Features

- International standard package
- 175°C Operating Temperature
- High current handling capability
- Avalanche rated
- Low $R_{DS(on)}$

Advantages

- Easy to mount
- Space savings
- High power density

pplications

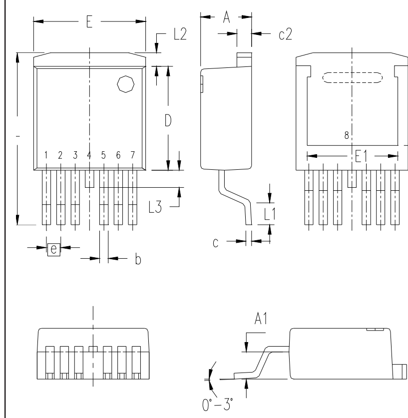
- Automotive
  - Motor Drives
  - 12V Battery
  - ABS Systems
- DC/DC Converters and Off-line UPS
- Primary- Side Switch
- High Current Switching Applications

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	55	94		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		10.8		nF
C_{oss}			1460		pF
C_{rss}			215		pF
$t_{d(on)}$	**Resistive Switching Times** V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 100A, R_G = 2Ω (External)		20		ns
t_r			27		ns
$t_{d(off)}$			36		ns
t_f			24		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		140		nC
Q_{gs}			52		nC
Q_{gd}			32		nC
R_{thJC}				0.31	°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			260	A
I_{SM}	Repetitive, Pulse width limited by T_{JM}			1000	A
V_{SD}	I_F = 100A, V_{GS} = 0V, Note 1			1.3	V
t_{rr}	I_F = 130A, V_{GS} = 0V, -di/dt = 100A/μs, V_R = 27V		60		ns
I_{RM}			3.4		A
Q_{RM}			102		nC

TO-263 (7-lead) (IXTA..7) Outline



Pins: 1 - Gate
2, 3 - Source
4 - Drain
5,6,7 - Source
Tab (8) - Drain

SYM	INCHES MIN	INCHES MAX	MILLIMETER MIN	MILLIMETER MAX
A	.170	.185	4.30	4.70
A1	.085	.104	2.15	2.65
b	.026	.035	0.65	0.90
c	.016	.024	0.40	0.60
c2	.049	.055	1.25	1.40
D	.355	.370	9.00	9.40
D1	.272	.280	6.90	7.10
E	.386	.402	9.80	10.20
E1	.311	.319	7.90	8.10
e	.050 BSC		1.27 BSC	
L	.591	.614	15.00	15.60
L1	.091	.110	2.30	2.80
L2	.039	.059	1.00	1.50
L3	.000	.059	0.00	1.50

Notes: 1. Pulse test, t ≤ 300μs; duty cycle, d ≤ 2%.
2. On through-hole packages, $R_{DS(on)}$ Kelvin test contact location must be 5mm or less from the package body.

PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

Fig. 1. Output Characteristics @ 25ºC

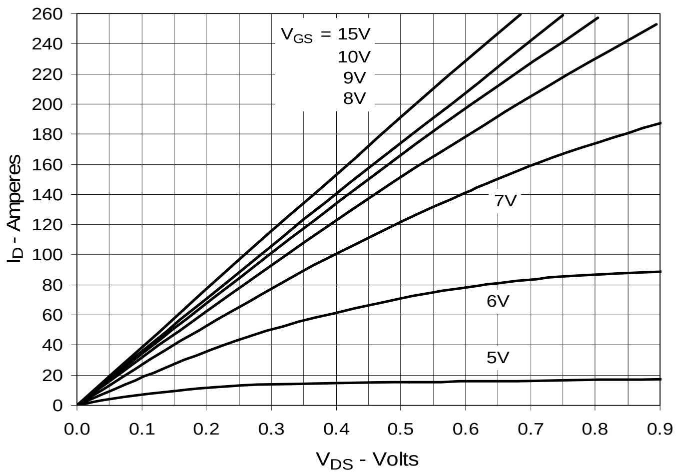


Fig. 2. Extended Output Characteristics @ 25ºC

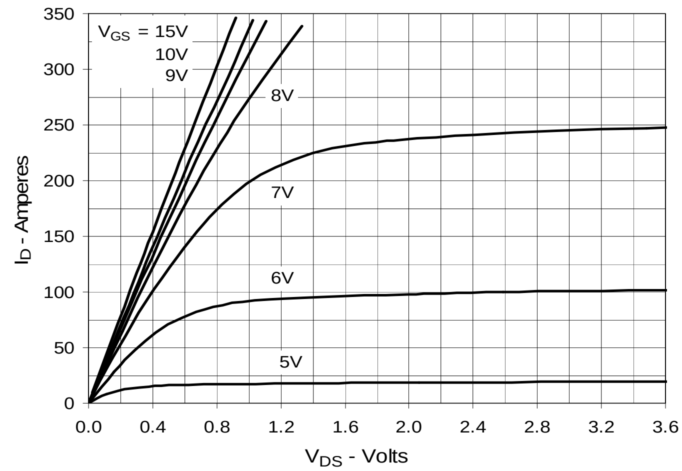


Fig. 3. Output Characteristics @ 150ºC

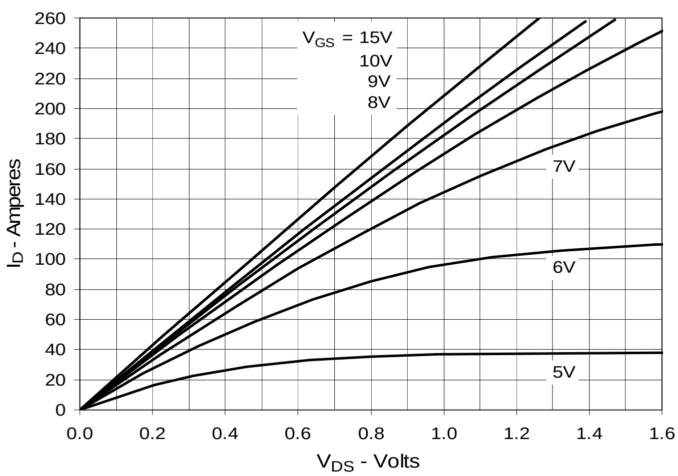


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 130A Value vs. Junction Temperature

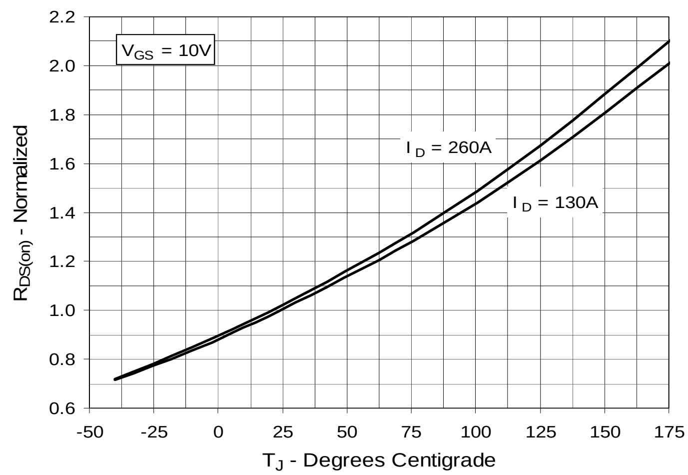


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 130A Value vs. Drain Current

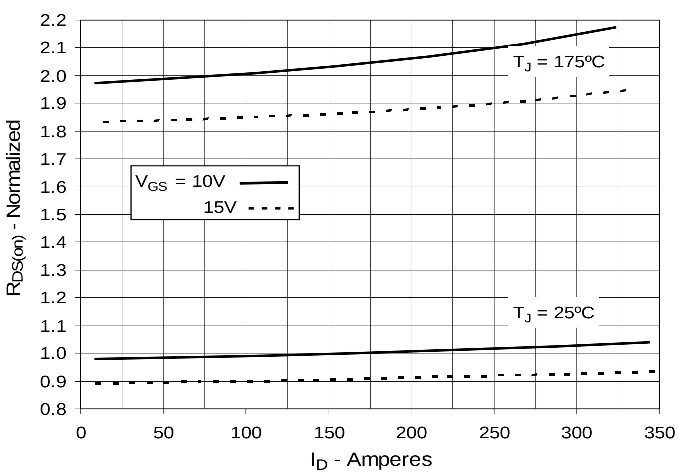


Fig. 6. Drain Current vs. Case Temperature

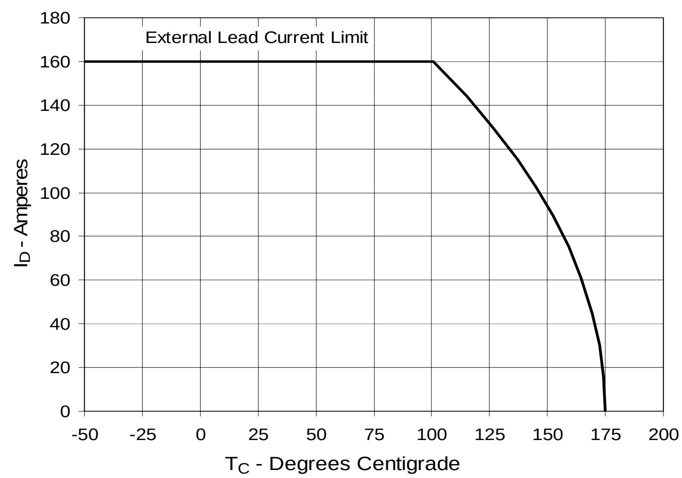


Fig. 7. Input Admittance

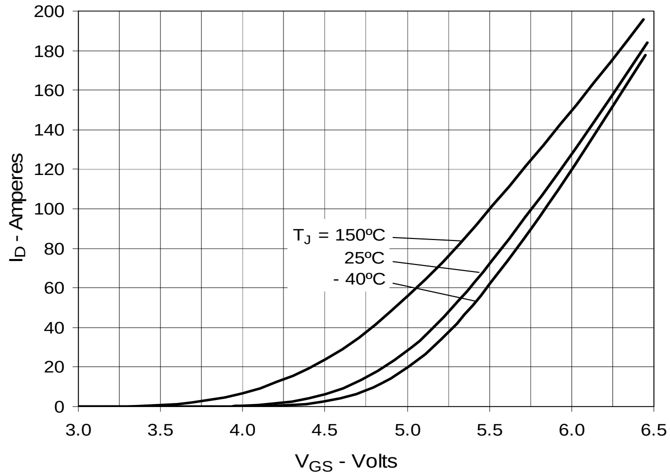


Fig. 8. Transconductance

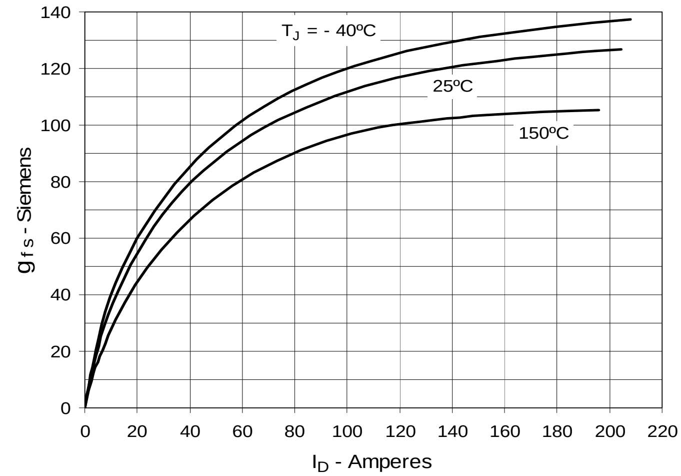


Fig. 9. Forward Voltage Drop of Intrinsic Diode

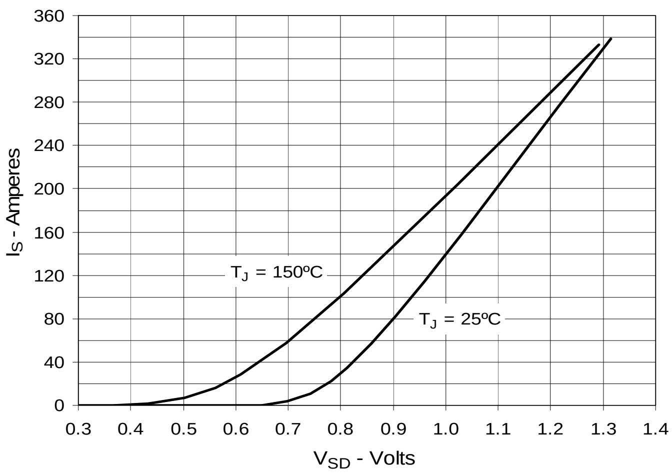


Fig. 10. Gate Charge

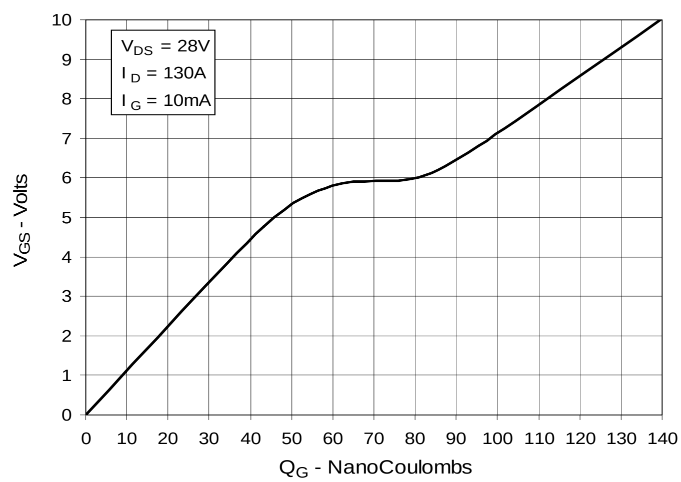


Fig. 11. Capacitance

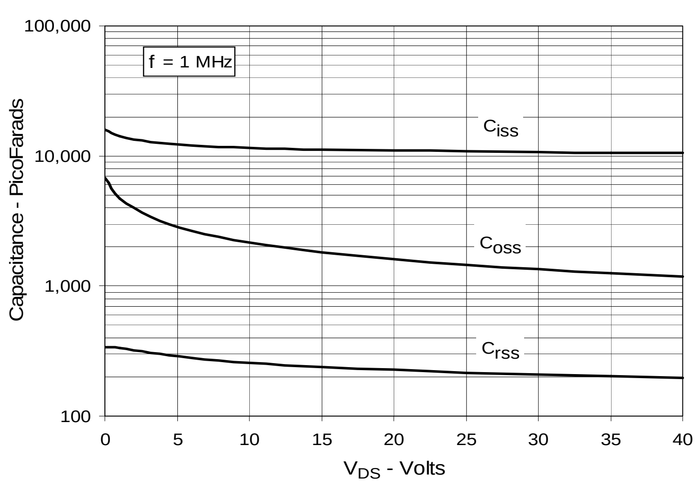
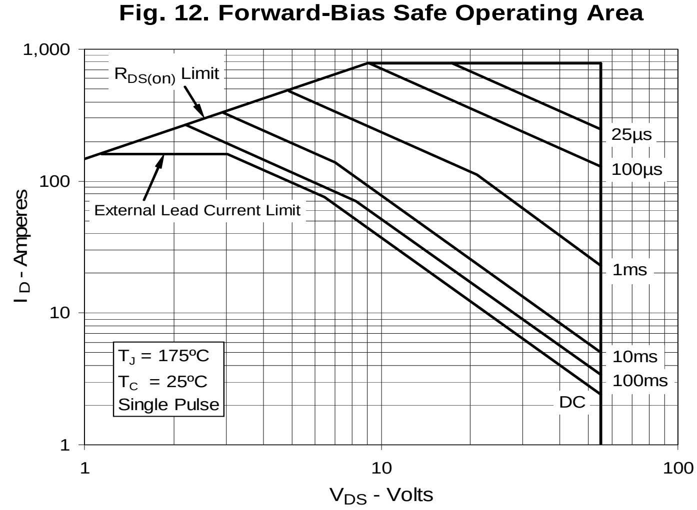


Fig. 12. Forward-Bias Safe Operating Area



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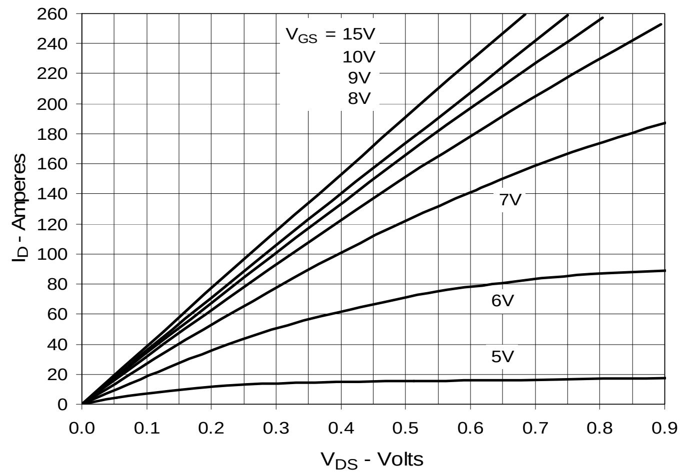

Fig. 2. Extended Output Characteristics @ 25ºC

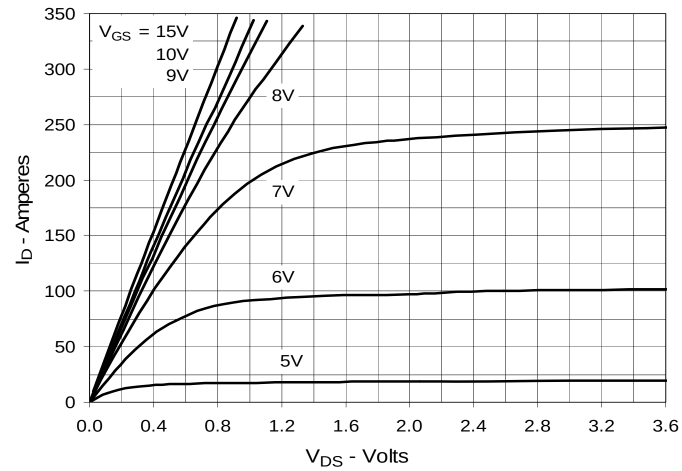

Fig. 3. Output Characteristics @ 150ºC

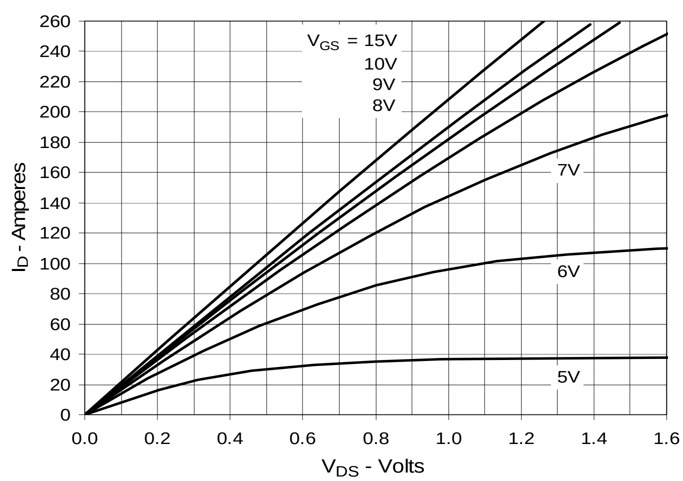

Fig. 4. $R_{DS(on)}$ Normalized to I_D = 130A Value vs. Junction Temperature

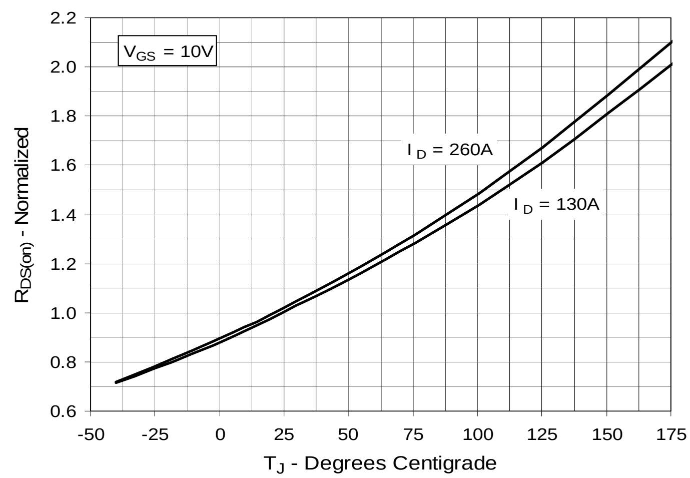

Fig. 5. $R_{DS(on)}$ Normalized to I_D = 130A Value vs. Drain Current

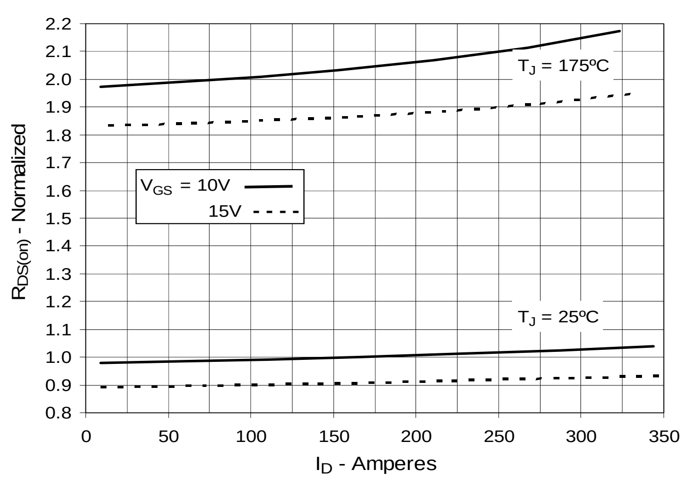

Fig. 6. Drain Current vs. Case Temperature

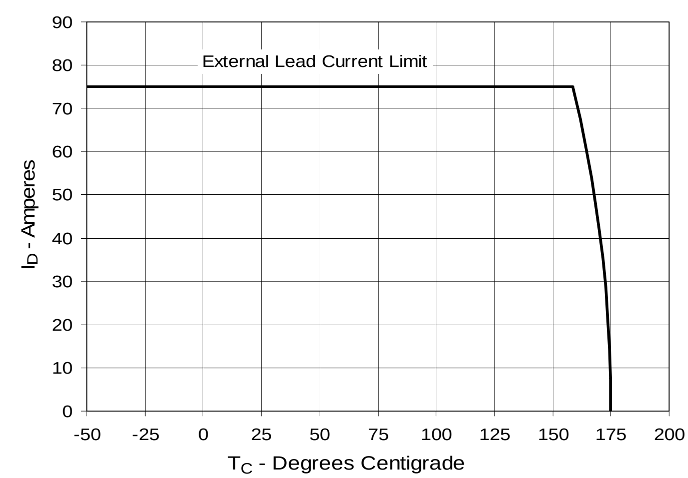

Fig. 19. Maximum Transient Thermal Impedance