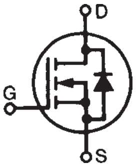
IXYS

TrenchHV™ Power MOSFET

IXTH150N17T

V_{DSS} = 175V
I_{D25} = 150A
$R_{DS(on)}$ ≤ 12mΩ

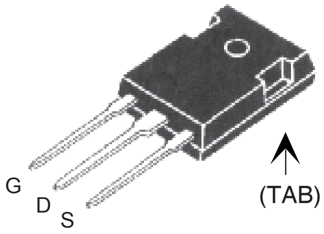
N-Channel Enhancement Mode
Avalanche Rated



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C	175	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ	175	V
V_{GSM}	Transient	± 30	V
I_{D25}	T_C = 25°C	150	A
I_{LRMS}	Lead Current Limit, RMS	75	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	400	A
I_A	T_C = 25°C	75	A
E_{AS}	T_C = 25°C	1.5	J
dV/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 175°C$	15	V/ns
P_D	T_C = 25°C	830	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
M_d	Mounting torque	1.13 / 10	Nm/lb.in.
Weight		6	g

Symbol	Test Conditions	Characteristic Values			
(T_J = 25°C unless otherwise specified)		Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250µA	175			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 1mA	2.5		5.0	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			250	µA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 0.5 • I_{D25}, Notes 1		10	12	mΩ

TO-247



G = Gate D = Drain
S = Source TAB = Drain

Features

- International standard package
- Avalanche rated
- 175°C Operating Temperature
- High current handling capability

Advantages

- Easy to mount
- Space savings
- High power density

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor drives
- Uninterruptible power supplies
- High speed power switching applications

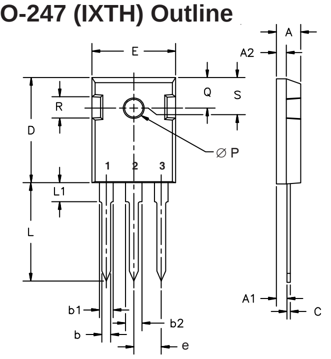
Symbol	**Test Conditions** (T_J = 25°C, unless otherwise specified)	**Characteristic Values** **Min.**	 **Typ.**	 **Max.**	
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	75	118		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		9800		pF
C_{oss}			1110		pF
C_{rss}			60		pF
$t_{d(on)}$	**Resistive Switching Times** V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25} R_G = 2Ω (External)		22		ns
t_r			30		ns
$t_{d(off)}$			58		ns
t_f			30		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 25A		155		nC
Q_{gs}			40		nC
Q_{gd}			47		nC
R_{thJC}				0.18	°C/W
R_{thCH}			0.21		°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			150	A
I_{SM}	Repetitive, Pulse width limited by T_{JM}			400	A
V_{SD}	I_F = 50A, V_{GS} = 0V, Note 1			1.2	V
t_{rr}	I_F = 75A, V_{GS} = 0V -di/dt = 200A/µs V_R = 85V		120		ns
I_{RM}			1.05		A
Q_{RM}			17.5		nC

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

TO-247 (IXTH) Outline



Terminals: 1 - Gate 2 - Drain

Dim.	Millimeter Min.	 Max.	Inches Min.	 Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216

Fig. 1. Output Characteristics @ 25ºC

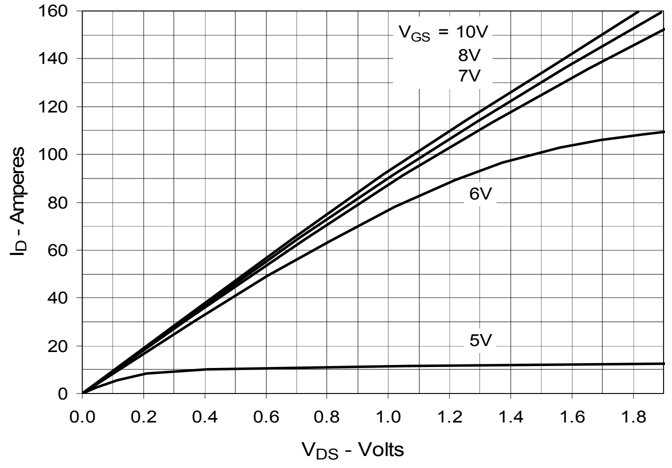


Fig. 2. Extended Output Characteristics @ 25ºC

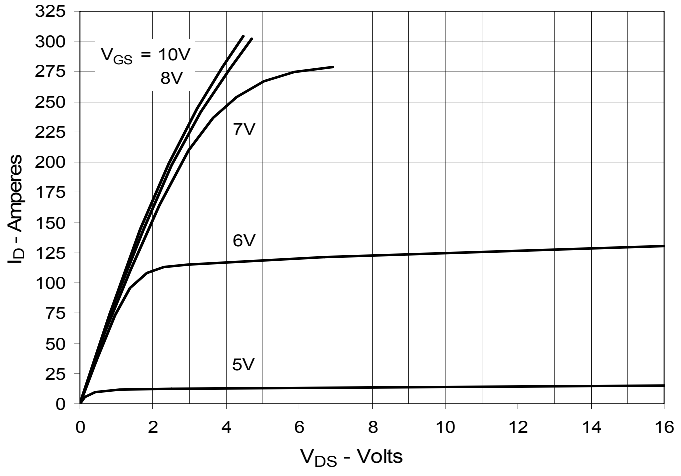


Fig. 3. Output Characteristics @ 150ºC

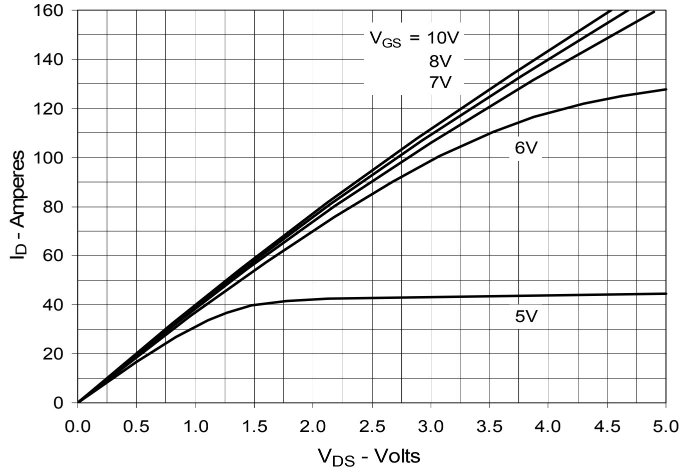


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 75A Value vs. Junction Temperature

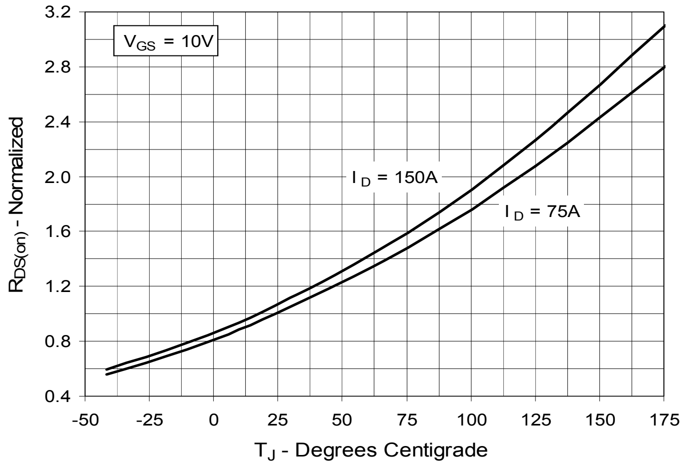


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 75A Value vs. Drain Current

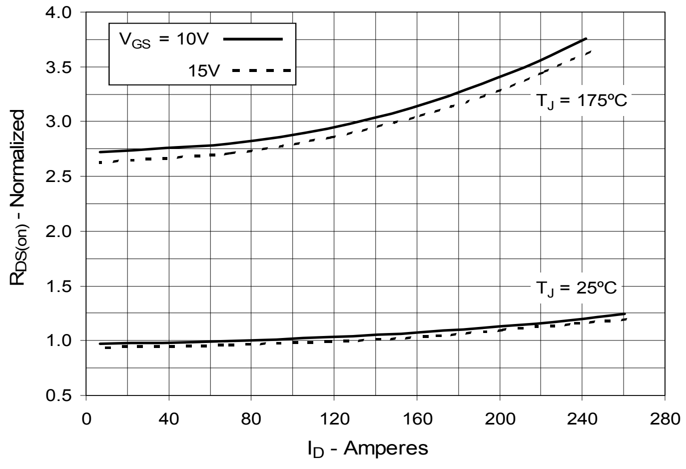


Fig. 6. Drain Current vs. Case Temperature

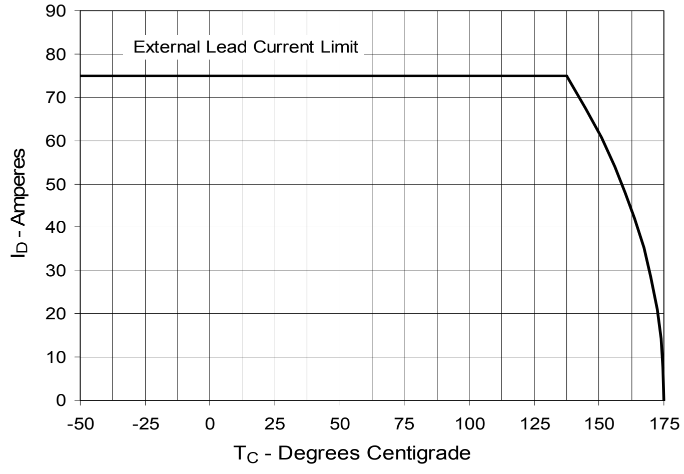


Fig. 7. Input Admittance

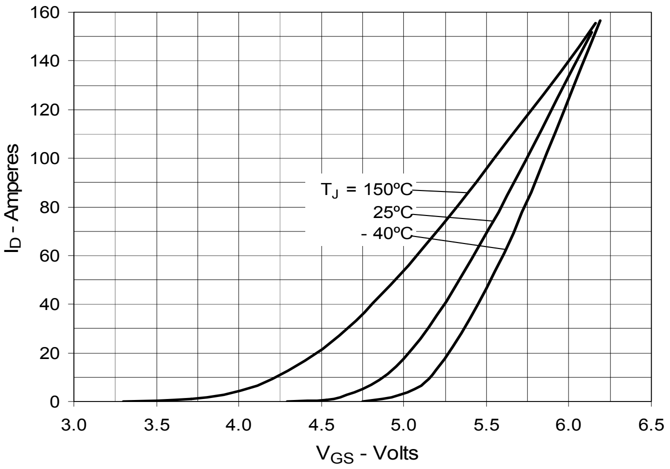


Fig. 8. Transconductance

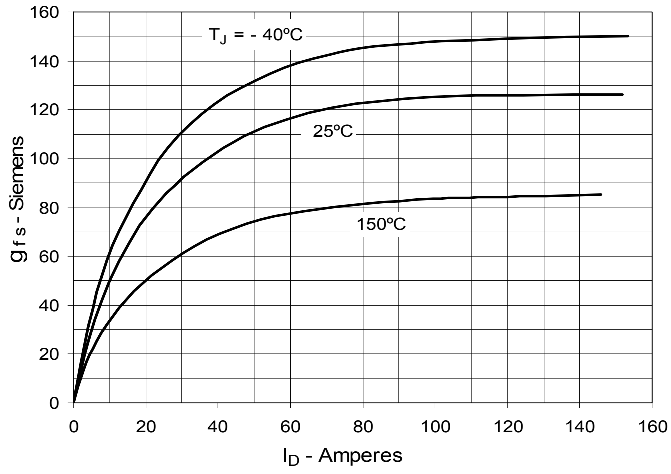


Fig. 9. Forward Voltage Drop of Intrinsic Diode

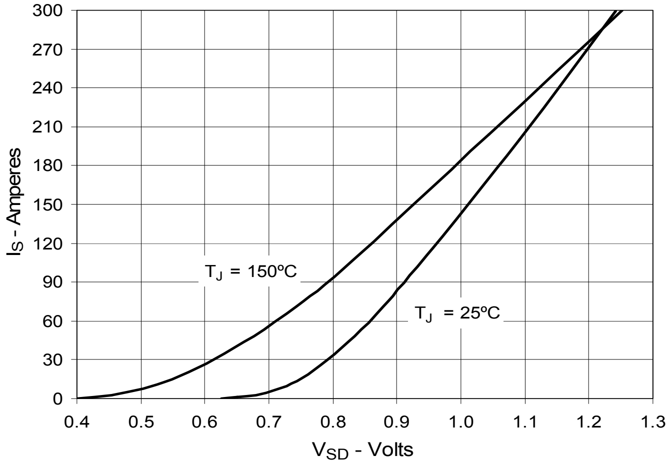


Fig. 10. Gate Charge

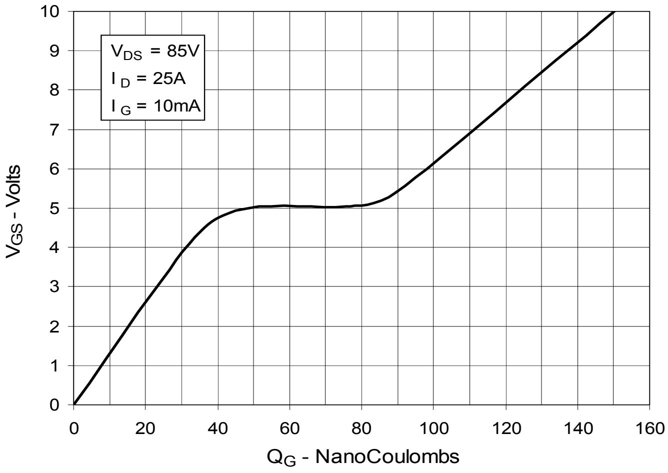


Fig. 11. Capacitance

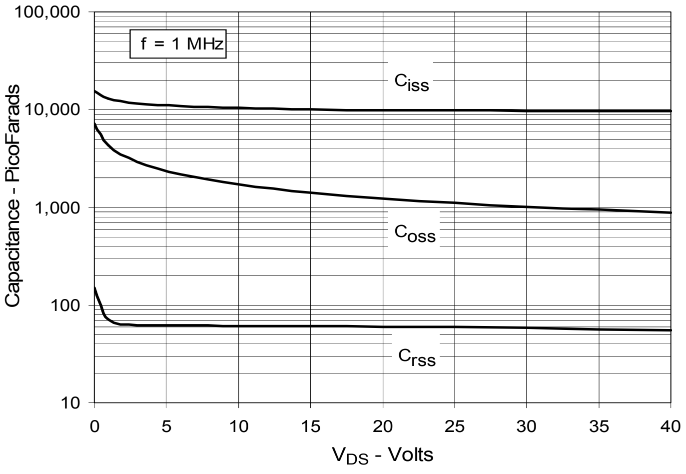


Fig. 12. Maximum Transient Thermal Impedance

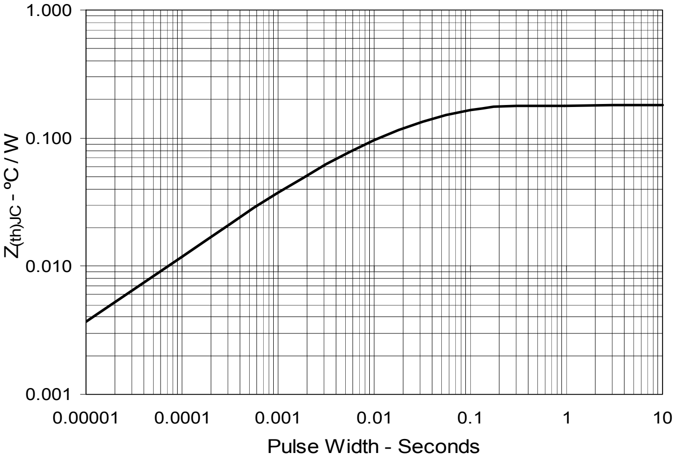


Fig. 13. Resistive Turn-on
Rise Time vs. Junction Temperature

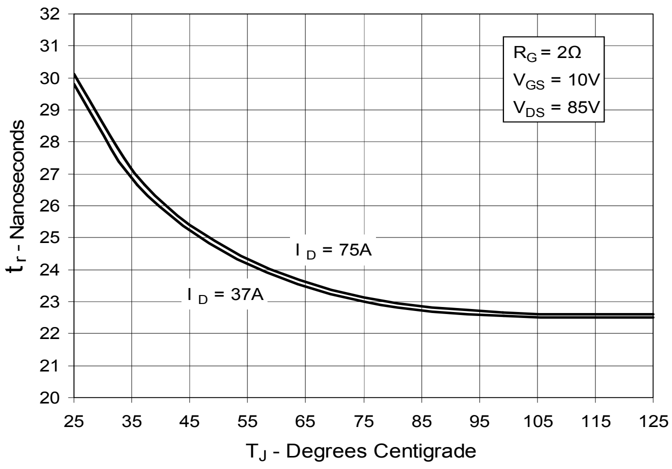


Fig. 14. Resistive Turn-on
Rise Time vs. Drain Current

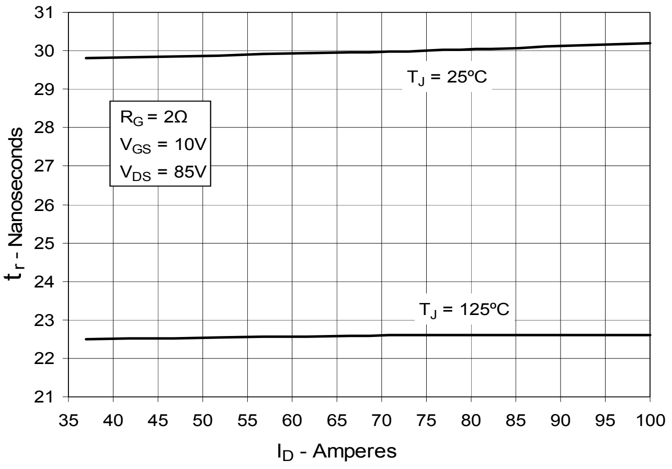


Fig. 15. Resistive Turn-on
Switching Times vs. Gate Resistance

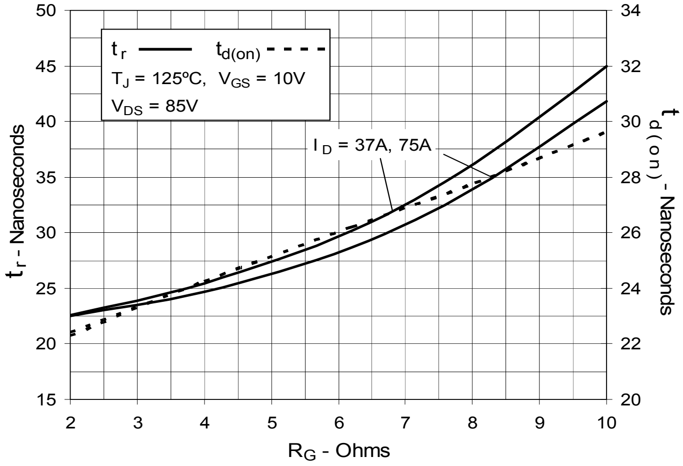


Fig. 16. Resistive Turn-off
Switching Times vs. Junction Temperature

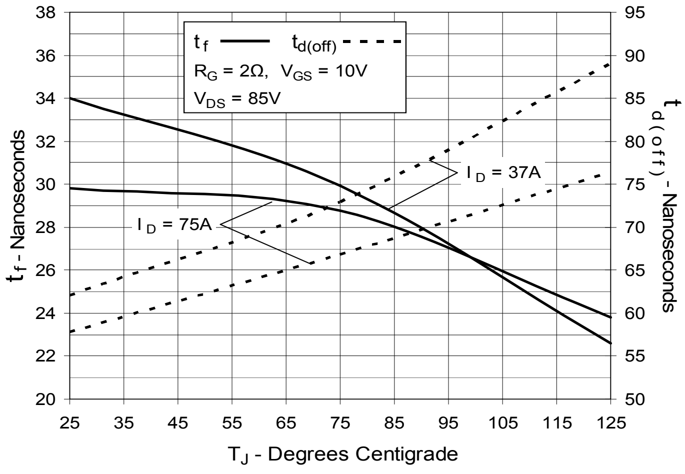


Fig. 17. Resistive Turn-off
Switching Times vs. Drain Current

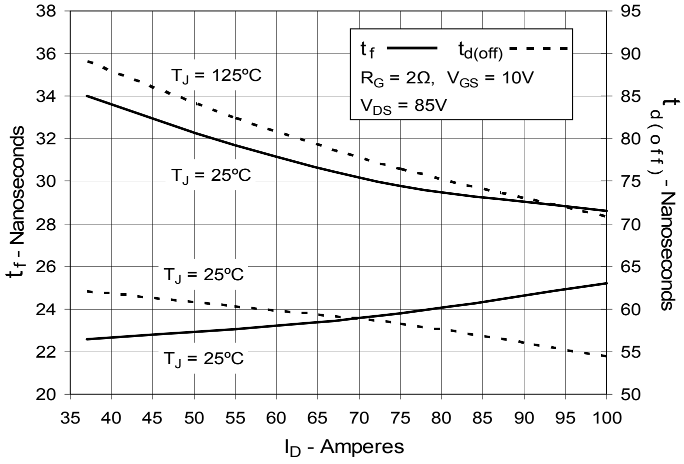


Fig. 18. Resistive Turn-off
Switching Times vs. Gate Resistance