

# TrenchP<sup>™</sup> Power MOSFET

## **IXTR140P10T**

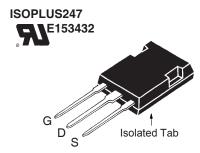
 $V_{DSS} = -100V$   $I_{D25} = -110A$   $R_{DS(an)} \le 11m\Omega$ 

P-Channel Enhancement Mode Avalanche Rated



Symbol	Test Conditions	Maximum Ratings			
V <sub>DSS</sub>	$T_{J} = 25^{\circ}C$ to $150^{\circ}C$	-100	V		
V <sub>DGR</sub>	$T_J = 25$ °C to 150°C, $R_{GS} = 1M\Omega$	-100	V		
V <sub>GSS</sub>	Continuous	±15	V		
V <sub>GSM</sub>	Transient	±25	V		
I <sub>D25</sub>	$T_{c} = 25^{\circ}C$	- 110	Α		
I <sub>DM</sub>	$T_{\rm C} = 25^{\circ}$ C, Pulse Width Limited by $T_{\rm JM}$	- 400	Α		
I <sub>A</sub>	T <sub>c</sub> = 25°C	-140	Α		
<b>E</b> <sub>AS</sub>	$T_{c} = 25^{\circ}C$	2.5	J		
dv/dt	$I_{_{S}}$ $\leq I_{_{DM}}, V_{_{DD}} \leq V_{_{DSS}}, T_{_{J}} \leq 150^{\circ}C$	10	V/ns		
$P_{D}$	T <sub>c</sub> = 25°C	270	W		
T <sub>J</sub>		- 55 +150 150	°C		
T <sub>JM</sub> T <sub>stg</sub>		- 55 +150	°C		
T <sub>L</sub> T <sub>SOLD</sub>	1.6mm (0.062 in.) from Case for 10s Plastic Body for 10s	300 260	°C °C		
V <sub>ISOL</sub>	50/60 Hz, 1 Minute	2500	V~		
F <sub>c</sub>	Mounting Force	20120/4.527	N/lb.		
Weight		5	g		
	·	·			

-,		cteristic				
$(1_{J} = 25^{\circ}C)$	, Unless Otherwise Specified)	IN.	lin.	Тур.	Max.	
BV <sub>DSS</sub>	$V_{GS} = 0V$ , $I_D = -250\mu A$	-1	00			V
$V_{\rm GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = -250\mu A$	- 2	2.0		- 4.0	V
I <sub>GSS</sub>	$V_{GS} = \pm 15V, V_{DS} = 0V$				±100	nA
I <sub>DSS</sub>	$V_{DS} = V_{DSS}, V_{GS} = 0V$				- 10	μΑ
		$T_J = 125^{\circ}C$			-150	μА
R <sub>DS(on)</sub>	$V_{GS} = -10V, I_{D} = -70A, Note$	1			11	mΩ



G = Gate D = DrainS = Source

### **Features**

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 2500V~ Electrical Isolation
- Avalanche Rated
- Extended FBSOA
- Fast Intrinsic Diode
- Low  $R_{DS(ON)}$  and  $Q_{G}$

### **Advantages**

- · Easy to Mount
- Space Savings
- High Power Density

### **Applications**

- High-Side Switching
- Push Pull Amplifiers
- DC Choppers
- Automatic Test Equipment
- Current Regulators
- Battery Charger Applications





Symbol	Chara	Values		
$(T_J = 25^{\circ}C, l)$	Unless Otherwise Specified)	Min.	Тур.	Max.
g <sub>fs</sub>	$V_{DS} = -10V, I_{D} = -70A, \text{ Note 1}$	70	115	S
C <sub>iss</sub>			32.8	nF
C <sub>oss</sub>	$V_{GS} = 0V, V_{DS} = -25V, f = 1MHz$		2290	pF
C <sub>rss</sub>			700	pF
t <sub>d(on)</sub>	Resistive Switching Times		58	ns
t <sub>r</sub>	$V_{GS} = -10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = -70A$		26	ns
t <sub>d(off)</sub>			86	ns
t <sub>f</sub>	$R_{g} = 1\Omega$ (External)		26	ns
$Q_{g(on)}$			400	nC
Q <sub>gs</sub>	$V_{GS} = -10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = -70A$		125	nC
Q <sub>gd</sub>			100	nC
R <sub>thJC</sub>				0.46 °C/W
R <sub>thCS</sub>			0.15	°C/W

# 1 = Gate 2,4 = Drain 3 = Source SYM NIN MAX MIN MAX A 190 205 4.83 5.21

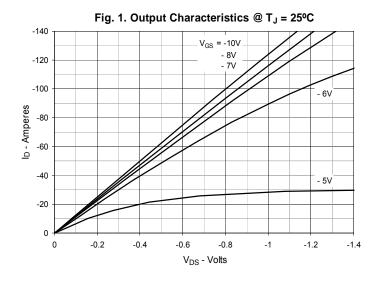
### A1 A2 .090 .100 2,29 2.54 2.16 1.40 2.15 3.20 0.83 .075 .045 .075 <u>ь</u> Ь1 .055 1.91 2.92 D.61 .085 .115 .126 .033 20,80 15,75 ,819 ,84D 21,34 .620 .780 .150 .220 .170 .520 .620 .8L1 .172 .244 4.3B 6.20 .191 .540 .640 4.32 13.21 15.75 4.85 13.72 16.26 .065 .080 1.65 2.03 0 ,004 0

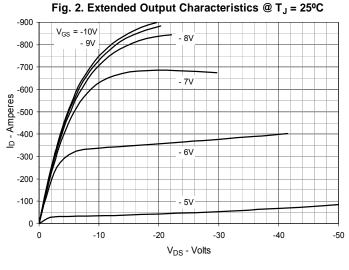
### Source-Drain Diode

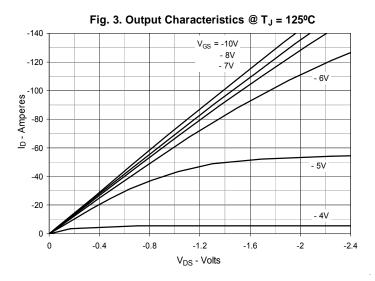
SymbolTest ConditionsChara $(T_J = 25^{\circ}C, Unless Otherwise Specified)$ Min.		cteristic \ Typ.	Values Max.		
I <sub>s</sub>	$V_{GS} = 0V$			-140	Α
I <sub>SM</sub>	Repetitive, Pulse Width Limited by $T_{_{\rm JM}}$			- 560	Α
V <sub>SD</sub>	$I_F = -100A, V_{GS} = 0V, \text{ Note 1}$			-1.4	V
$\left\{egin{array}{c} \mathbf{t}_{rr} & \ \mathbf{Q}_{RM} \ \mathbf{I}_{RM} \end{array} ight.$	$I_{_{\rm F}}$ = - 70A, -di/dt = -100A/ $\mu$ s $V_{_{\rm R}}$ = -100V, $V_{_{\rm GS}}$ = 0V		130 650 -10		ns nC A

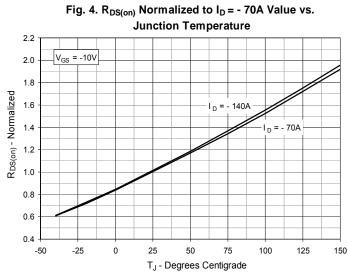
Note 1. Pulse test,  $t \le 300\mu s$ , duty cycle,  $d \le 2\%$ .

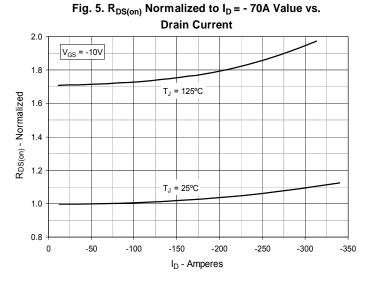


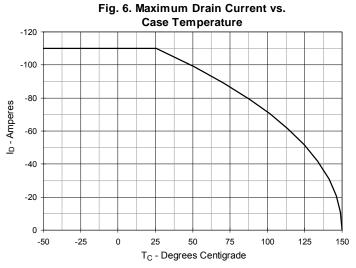




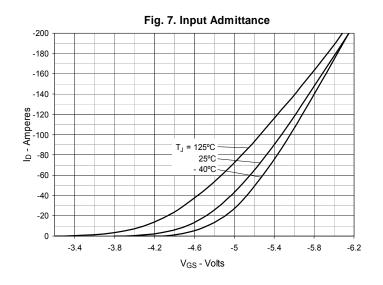


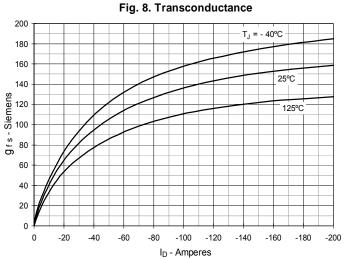


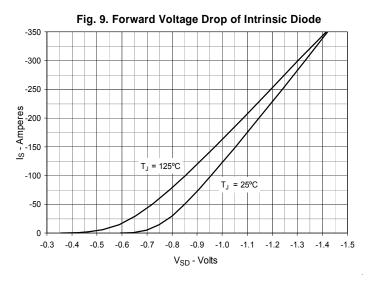


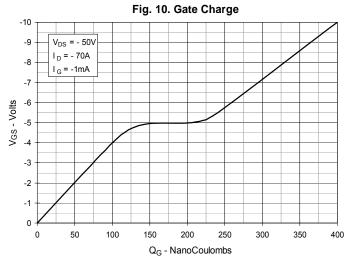


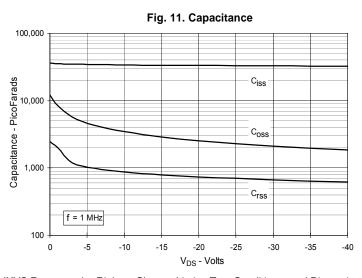


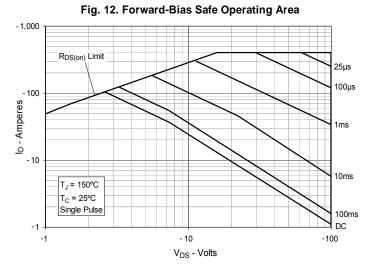












 $\ensuremath{\mathsf{IXYS}}$  Reserves the Right to Change Limits, Test Conditions, and Dimensions.



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

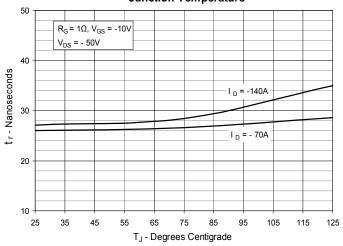


Fig. 14. Resistive Turn-on Rise Time vs.
Drain Current

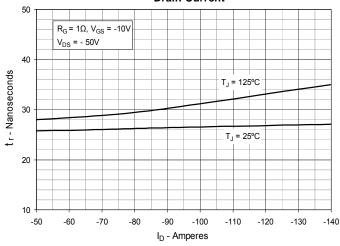


Fig. 15. Resistive Turn-on Switching Times vs.
Gate Resistance

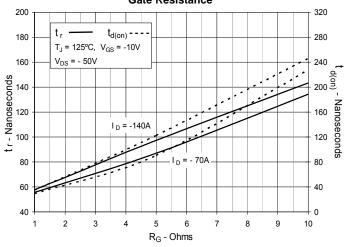


Fig. 16. Resistive Turn-off Switching Times vs.

Junction Temperature

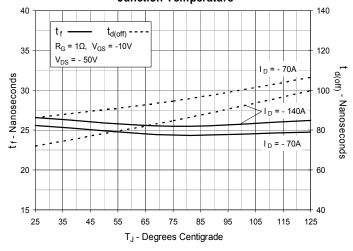


Fig. 17. Resistive Turn-off Switching Times vs.

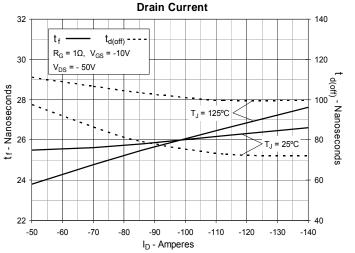
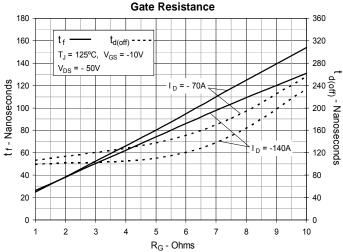


Fig. 18. Resistive Turn-off Switching Times vs.



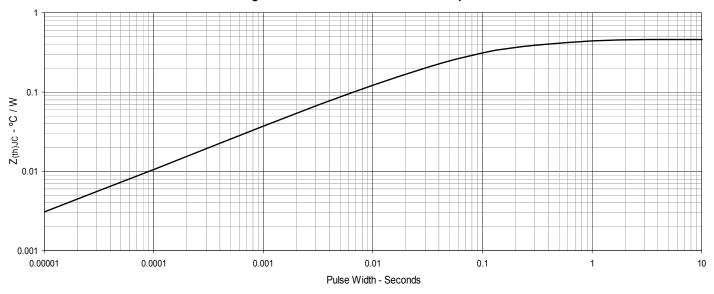


Fig. 19. Maximum Transient Thermal Impedance

