

TrenchMV[™] Power **MOSFET**

IXTH200N10T IXTQ200N10T

N-Channel Enhancement Mode Avalanche Rated



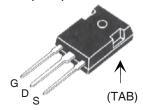
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Test Conditions	Maximum F	Ratings
T __ = 25°C to 175°C	100	V
$T_J = 25^{\circ}C$ to 175°C, $R_{GS} = 1M\Omega$	100	V
Transient	±30	V
T _c = 25°C	200	A
Lead Current Limit, RMS	75	Α
$T_{_{\rm C}} = 25^{\circ}$ C, pulse width limited by $T_{_{\rm JM}}$	500	Α
$T_{c} = 25^{\circ}C$	40	А
$T_{c} = 25^{\circ}C$	1.5	J
T _c = 25°C	550	W
	-55 +175	°C
	175	°C
	-55 +175	°C
1.6mm (0.062in.) from case for 10s	300	°C
Plastic body for 10 seconds	260	°C
Mounting torque	1.13 / 10	Nm/lb.in.
TO-247 TO-3P	6.0 5.5	g g
	$T_{_{\rm J}}=25^{\circ}{\rm C}$ to 175°C $T_{_{\rm J}}=25^{\circ}{\rm C}$ to 175°C, $R_{_{\rm GS}}=1{\rm M}\Omega$ Transient $T_{_{\rm C}}=25^{\circ}{\rm C}$ Lead Current Limit, RMS $T_{_{\rm C}}=25^{\circ}{\rm C}$, pulse width limited by $T_{_{\rm JM}}$ $T_{_{\rm C}}=25^{\circ}{\rm C}$ $T_{_{\rm C}}=25^{\circ}{\rm C}$ $T_{_{\rm C}}=25^{\circ}{\rm C}$ $T_{_{\rm C}}=25^{\circ}{\rm C}$ 1.6mm (0.062in.) from case for 10s Plastic body for 10 seconds Mounting torque TO -247	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

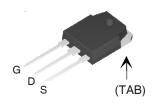
Symbol (T _J = 25°C	SymbolTest ConditionsChar $(T_J = 25^{\circ}\text{C unless otherwise specified})$ Min.		racteris Typ.	stic Values Max.
BV _{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	100		V
V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250\mu A$	2.5		4.5 V
I _{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			±200 nA
I _{DSS}	$V_{DS} = V_{DSS}$			5 μΑ
	$V_{GS} = 0V$ $T_{J} = 150^{\circ}C$			250 μΑ
R _{DS(on)}	V _{GS} = 10V, I _D = 50A, Notes 1, 2		4.5	5.5 mΩ

V_{DSS} 100V 200A $5.5 m\Omega$ $R_{DS(on)} \leq$

TO-247 (IXTH)



TO-3P (IXTQ)



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

Features

- International standard packages
- 175°C Operating Temperature
- Avalanche Rated
- Low R_{DS(on)}

Advantages

- Easy to mount
- Space savings
- High power density

Applications

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



Symbo		Test Conditions			Values
$(1_{J} = 25)$	5°C, ι	unless otherwise specified)	Min.	Тур.	Max.
\mathbf{g}_{fs}		$V_{DS} = 10V, I_{D} = 60A, \text{ Note 1}$	60	96	S
C _{iss})			9400	pF
\mathbf{C}_{oss}	}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		1087	pF
C _{rss}	J			140	pF
t _{d(on)})	Butting a training		35	ns
t _r		Resistive Switching Times		31	ns
t _{d(off)}		$V_{GS} = 10V$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_{D} = 50A$ $R_{G} = 3.3\Omega$ (External)		45	ns
t _f	J	···G		34	ns
Q _{g(on)})			152	nC
Q_{gs}	}	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 50A$		47	nC
\mathbf{Q}_{gd}	J			47	nC
R _{thJC}					0.27 °C/W
R _{thCH}				0.25	°C/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values			
$(T_J = 25^{\circ}C,$	unless otherwise specified)	Min.	Тур.	Max.	
I _s	$V_{GS} = 0V$			200	Α
I _{SM}	Repetitive, Pulse width limited by T_{JM}			500	Α
V _{SD}	$I_F = 50A, V_{GS} = 0V, \text{ Note 1}$			1.0	V
$\left. egin{array}{ll} \mathbf{t}_{rr} & & \\ \mathbf{Q}_{RM} & & \\ \mathbf{I}_{RM} & & \end{array} ight. ight.$	$I_{_{\rm F}} = 100 {\rm A}, V_{_{\rm GS}} = 0 {\rm V}, -{\rm di}/{\rm dt} = 100 {\rm A}/{\rm \mu s}$ $V_{_{\rm R}} = 50 {\rm V}$		76 205 5.4		ns nC A

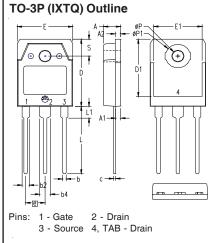
Notes: 1. Pulse test, $t \le 300\mu s$; duty cycle, $d \le 2\%$.

2. On through-hole packages, $R_{{\rm DS(on)}}$ Kelvin test contact location must be 5mm or less from the package body.

TO-247 (IXTH) Outline

Terminals: 1 - Gate 2 - Drain

Dim.	Millimeter		Inc	hes
	Min.	Max.	Min.	Max.
Α	4.7	5.3	.185	.209
A,	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
С	.4	.8	.016	.031
D	20.80	21.46	.819	.845
Е	15.75	16.26	.610	.640
е	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216



SYM	INCHES		MILLIMETERS	
SIM	MIN	MAX	MIN	MAX
Α	.185	.193	4.70	4.90
Α1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	0.90	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
С	.022	.031	0.55	0.80
D	.780	.791	19.80	20.10
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.50	13.70
е	.215	BSC	5.45 BSC	
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
øΡ	.126	.134	3.20	3.40
øP1	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10
All metal area are tin plated.				

IXYS reserves the right to change limits, test conditions, and dimensions.

Fig. 1. Output Characteristics @ 25°C

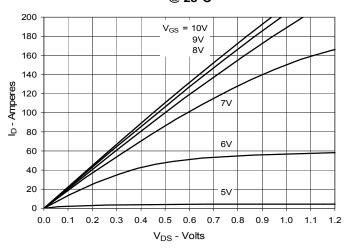


Fig. 3. Output Characteristics @ 150°C

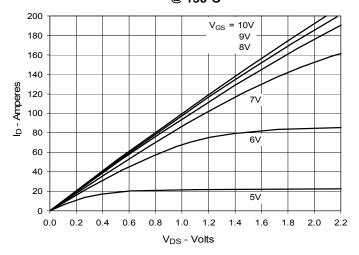


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 100A$ Value vs. Drain Current

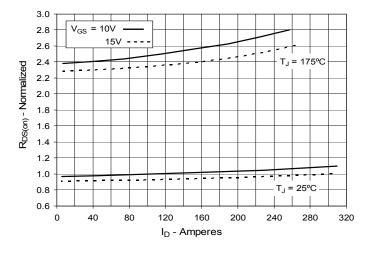


Fig. 2. Extended Output Characteristics
@ 25°C

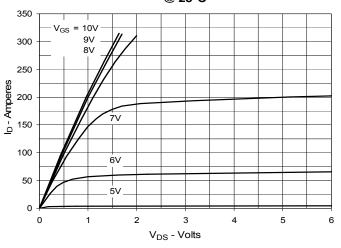


Fig. 4. R_{DS(on)} Normalized to I_D = 100A Value vs. Junction Temperature

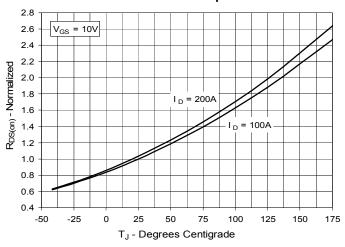


Fig. 6. Drain Current vs. Case Temperature

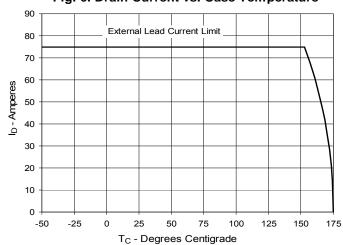
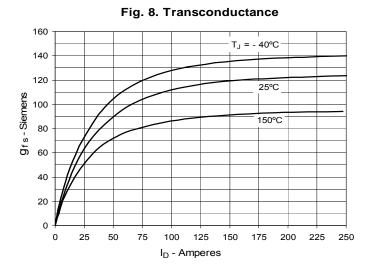




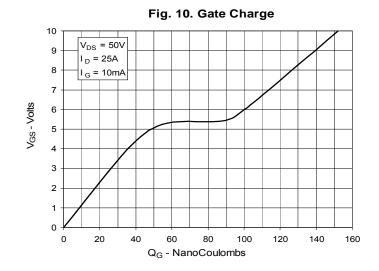
Fig. 7. Input Admittance 250 225 200 175 Amperes 150 125 $T_J = 150$ °C 25°C 100 - 40°C 75 50 25 0 7.5 3.5 4.0 4.5 5.0 6.0 6.5 7.0 5.5 V_{GS} - Volts

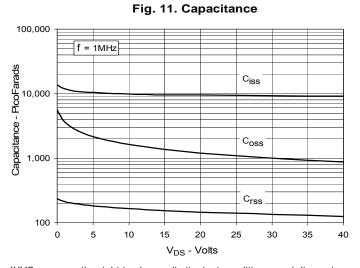


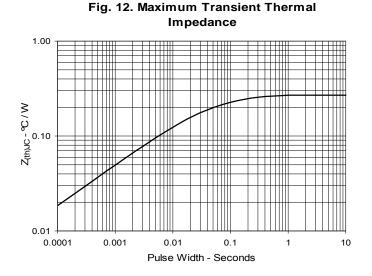
Intrinsic Diode 300 270 240 210 ls - Amperes 180 150 120 T_J = 150°C 90 T_J = 25℃ 60 30 0 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2

V_{SD} - Volts

Fig. 9. Forward Voltage Drop of







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

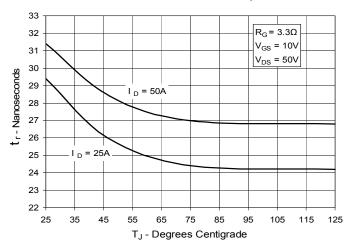


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

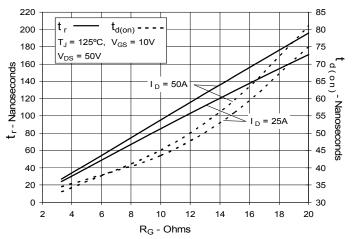


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

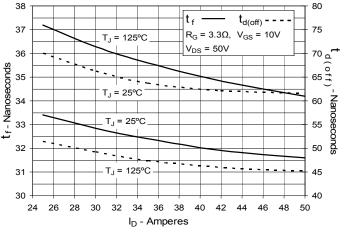


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

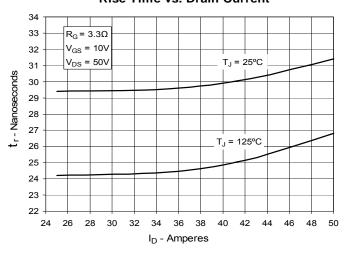


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

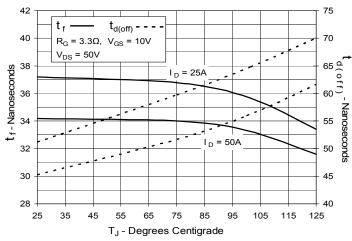


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

