

# TrenchMV™

## Power MOSFETs

### Common-Gate Pair

(Electrically Isolated Back Surface)

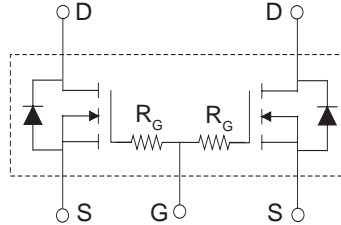
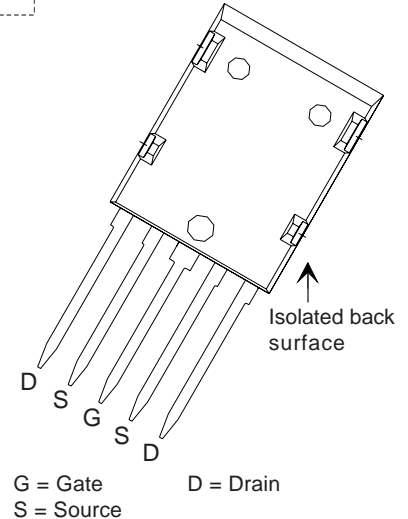
**IXTL2x180N10T**

$$V_{DSS} = 100 \text{ V}$$

$$I_{D25} = 2 \times 100 \text{ A}$$

$$R_{DS(on)} \leq 7.4 \text{ m}\Omega$$

N-Channel Enhancement Mode  
Avalanche Rated


**ISOPLUS i5-Pak™ (IXTL)**


Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$	100	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	100	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$ (Combined die total = 200 A)	100	A
$I_{LRMS}$	Package Current Limit, RMS (Combined die total = 150 A)	75	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	450	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	25	A
$E_{AS}$	$T_C = 25^\circ\text{C}$	750	mJ
$dv/dt$	$I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ $T_J \leq 175^\circ\text{C}$ , $R_G = 3.3 \Omega$	3	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	150	W
$T_J$		-55 ... +175	$^\circ\text{C}$
$T_{JM}$		175	$^\circ\text{C}$
$T_{stg}$		-55 ... +175	$^\circ\text{C}$
$T_L$	1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
$T_{SOLD}$	Plastic body for 10 seconds	260	$^\circ\text{C}$
$V_{ISOL}$	50/60 Hz, $t = 1$ minute, $I_{ISOL} < 1 \text{ mA}$ , RMS	2500	V
$F_C$	Mounting force	20..120/4.5..25	N/lb.
<b>Weight</b>		9	g

**Features**

- Ultra-low On Resistance
- Unclamped Inductive Switching (UIS) rated
- Low package inductance  
- easy to drive and to protect
- 175  $^\circ\text{C}$  Operating Temperature

**Advantages**

- Easy to mount
- Space savings
- High power density

**Applications**

- Automotive
  - Motor Drives
  - 42V Power Bus
  - ABS Systems
- DC/DC Converters and Off-line UPS
- Primary Switch for 24V and 48V Systems
- Distributed Power Architectures and VRMs
- Electronic Valve Train Systems
- High Current Switching Applications
- High Voltage Synchronous Rectifier

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$	100		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250 \mu\text{A}$	2.5		4.5 V
$I_{GSS}$	$V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$			$\pm 200 \text{ nA}$
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 150^\circ\text{C}$			5 $\mu\text{A}$ 250 $\mu\text{A}$
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$ , $I_D = 50 \text{ A}$ , Notes 1, 2			7.4 m $\Omega$

All ratings and parametric values are per each MOSFET die unless otherwise specified.

DS9999752(01/07)

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ unless otherwise specified)		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10\text{ V}$ ; $I_D = 60\text{ A}$ , Note 1	70	110	S
$R_G$			3	$\Omega$
$C_{iss}$			6900	pF
$C_{oss}$	$V_{GS} = 0\text{ V}$ , $V_{DS} = 25\text{ V}$ , $f = 1\text{ MHz}$		923	pF
$C_{rss}$			162	pF
$t_{d(on)}$			33	ns
$t_r$	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0.5 V_{DSS}$ , $I_D = 25\text{ A}$		54	ns
$t_{d(off)}$	$R_G = 3.3\ \Omega$ (External)		42	ns
$t_f$			31	ns
$Q_{g(on)}$			151	nC
$Q_{gs}$	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0.5 V_{DSS}$ , $I_D = 25\text{ A}$		39	nC
$Q_{gd}$			45	nC
$R_{thJC}$			1.0	$^\circ\text{C/W}$
$R_{thCS}$		0.50		$^\circ\text{C/W}$

### Source-Drain Diode

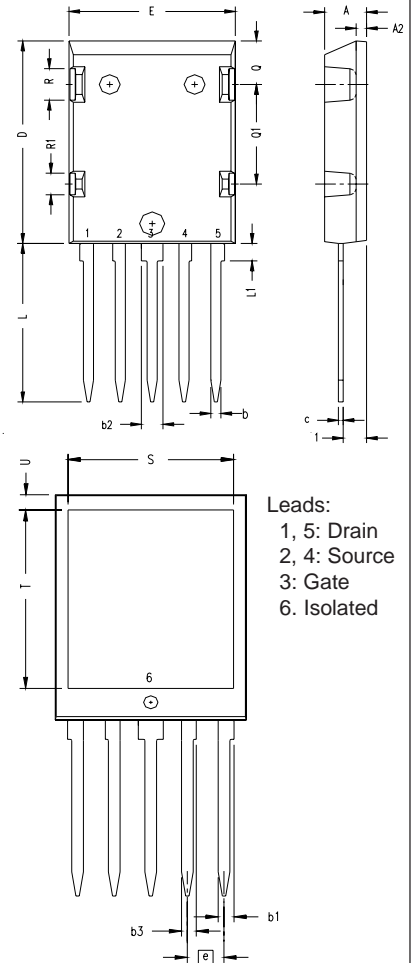
Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ unless otherwise specified)		
		Min.	Typ.	Max.
$I_s$	$V_{GS} = 0\text{ V}$			180 A
$I_{SM}$	Pulse width limited by $T_{JM}$			450 A
$V_{SD}$	$I_F = 50\text{ A}$ , $V_{GS} = 0\text{ V}$ , Note 1			1.0 V
$t_{rr}$	$I_F = 25\text{ A}$ , $-di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 50\text{ V}$ , $V_{GS} = 0\text{ V}$		60	ns

- Notes: 1. Pulse test:  $t \leq 300\ \mu\text{s}$ , duty cycle  $d \leq 2\%$ ;  
2. Drain and Source Kelvin contacts must be located less than 5 mm from the plastic body.

### ADVANCED 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.

### ISOPLUS i5-Pak™ (IXTL) Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.102	.118	2.59	3.00
A2	.046	.055	1.17	1.40
b	.045	.055	1.14	1.40
b1	.063	.072	1.60	1.83
b2	.100	.110	2.54	2.79
b3	.058	.068	1.47	1.73
c	.020	.029	0.51	0.74
D	1.020	1.040	25.91	26.42
E	.770	.799	19.56	20.29
e	.150 BSC		3.81 BSC	
L	.780	.820	19.81	20.83
L1	.080	.102	2.03	2.59
Q	.210	.235	5.33	5.97
Q1	.490	.513	12.45	13.03
R	.150	.180	3.81	4.57
R1	.100	.130	2.54	3.30
S	.668	.690	16.97	17.53
T	.801	.821	20.34	20.85
U	.065	.080	1.65	2.03

- Note:  
1. TAB 6 - Electrically isolated from the other pins.  
2. All leads and tab are tin plated.

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

IXYS MOSFETs and IGBTs are covered by 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2  
one or more of the following U.S. patents: 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2  
4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537