

# TrenchMV™

## Power MOSFETs

### Common-Gate Pair

(Electrically Isolated Back Surface)

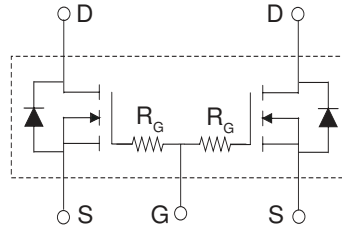
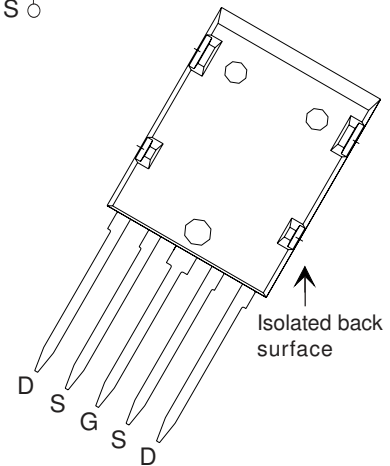
**IXTL2x220N075T**

$$V_{DSS} = 75 \text{ V}$$

$$I_{D25} = 2 \times 120 \text{ A}$$

$$R_{DS(on)} \leq 5.5 \text{ m}\Omega$$

N-Channel Enhancement Mode  
Avalanche Rated


**ISOPLUSi5-Pak™ (IXTL)**


G = Gate      D = Drain  
S = Source

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$	75	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	75	V
$V_{GSM}$	Transient	$\pm 20$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$ (Combined die total = 240 A)	120	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 $T_{JM}$	600	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	25	A
$E_{AS}$	$T_C = 25^\circ\text{C}$	1.0	J
$dv/dt$	$I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ $T_J \leq 175^\circ\text{C}$ , $R_G = 3.3 \Omega$	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 °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
- High Current Switching Applications

	Test Conditions ( $T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$	75		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250 \mu\text{A}$	2.0		4.0 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			5.5 $\text{m}\Omega$

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

DS99750(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	75	120	S
$R_G$			3	$\Omega$
$C_{iss}$			7700	pF
$C_{oss}$	$V_{GS} = 0\text{ V}$ , $V_{DS} = 25\text{ V}$ , $f = 1\text{ MHz}$		1100	pF
$C_{rss}$			230	pF
$t_{d(on)}$			29	ns
$t_r$	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0.5 V_{DSS}$ , $I_D = 25\text{ A}$		65	ns
$t_{d(off)}$	$R_G = 3.3\ \Omega$ (External)		55	ns
$t_f$			47	ns
$Q_{g(on)}$			165	nC
$Q_{gs}$	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0.5 V_{DSS}$ , $I_D = 25\text{ A}$		40	nC
$Q_{gd}$			50	nC
$R_{thJC}$			1.0	$^\circ\text{C/W}$
$R_{thCS}$		0.5		$^\circ\text{C/W}$

### Source-Drain Diode

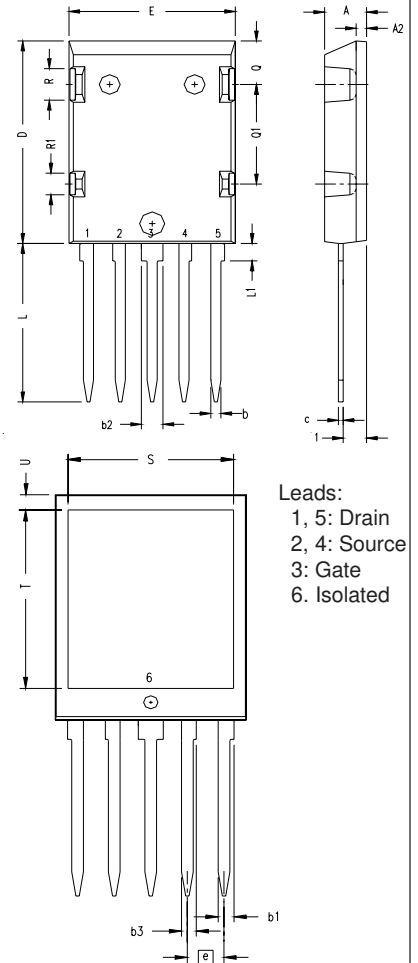
Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ unless otherwise specified)		
		Min.	Typ.	Max.
$I_S$	$V_{GS} = 0\text{ V}$			220 A
$I_{SM}$	Pulse width limited by $T_{JM}$			600 A
$V_{SD}$	$I_F = 50\text{ A}$ , $V_{GS} = 0\text{ V}$ , Note 1			1.0 V
$t_{rr}$	$I_F = 25\text{ A}$ , $-di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 40\text{ V}$ , $V_{GS} = 0\text{ V}$		50	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.

### ADVANCETECHNICALINFORMATION

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



- Leads:  
1, 5: Drain  
2, 4: Source  
3: Gate  
6: Isolated

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.

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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