

# Linear Power MOSFET IXTK17N120L With Extended FBSOA IXTX17N120L

N-Channel Enhancement Mode



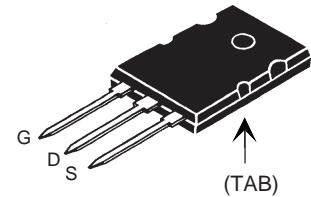
$$V_{DSS} = 1200 \text{ V}$$

$$I_{D25} = 17 \text{ A}$$

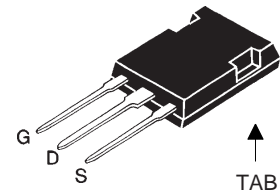
$$R_{DS(on)} \leq 0.99 \text{ } \Omega$$

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	1200	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	1200	V
$V_{GS}$	Continuous	$\pm 30$	V
$V_{GSM}$	Transient	$\pm 40$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	17	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	30	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	10	A
$E_{AR}$	$T_C = 25^\circ\text{C}$	60	mJ
$E_{AS}$		1.5	J
$P_D$	$T_C = 25^\circ\text{C}$	700	W
$T_J$		-55 to +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 to +150	$^\circ\text{C}$
$T_L$	1.6 mm (0.063 in) from case for 10 s	300	$^\circ\text{C}$
$T_{SOLD}$	Plastic body for 10 s	260	$^\circ\text{C}$
$M_d$	Mounting torque (TO-264)	1.13/10	Nm/lb.in.
$F_c$	Mounting force (PLUS247™)	20...120/4.5...27	N/lb.
<b>Weight</b>	PLUS247	6	g
	TO-264	10	g

TO-264 (IXTK)



PLUS247 (IXTX)



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

## Features

- Designed for linear operation
- International standard package
- Unclamped Inductive switching (UIS) rated
- Molding epoxies meet UL 94 V-0 flammability classification

## Applications

- Programmable loads
- Current regulators
- DC-DC converters
- Battery chargers
- DC choppers
- Temperature and lighting controls

## Advantages

- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0 \text{ V}$ , $I_D = 1 \text{ mA}$	1200		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250 \text{ } \mu\text{A}$	3		V
$I_{GSS}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0 \text{ V}$			$\pm 200 \text{ nA}$
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$	$T_J = 25^\circ\text{C}$		50 $\mu\text{A}$
		$T_J = 125^\circ\text{C}$		2 mA
$R_{DS(on)}$	$V_{GS} = 20 \text{ V}$ , $I_D = 0.5 I_{D25}$ , Note 1			0.99 $\Omega$

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

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)			
		Min.	Typ.	Max.	
$g_{fs}$	$V_{DS} = 20\text{ V}$ ; $I_D = 0.5 \cdot I_{D25}$ , Note 1	3.5	5.0	7.5	S
$C_{iss}$	$V_{GS} = 0\text{ V}$ , $V_{DS} = 25\text{ V}$ , $f = 1\text{ MHz}$	8000		pF	
$C_{oss}$		520		pF	
$C_{rss}$		86		pF	
$t_{d(on)}$	$V_{GS} = 15\text{ V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$	40		ns	
$t_r$		39		ns	
$t_{d(off)}$		75		ns	
$t_f$		63		ns	
$Q_{g(on)}$	$V_{GS} = 15\text{ V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$	270		nC	
$Q_{gs}$		70		nC	
$Q_{gd}$		110		nC	
$R_{thJC}$		0.18		$^\circ\text{C/W}$	
$R_{thCS}$		0.15		$^\circ\text{C/W}$	

### Safe Operating Area Specification

Symbol	Test Conditions	Min.	Typ.	Max.
SOA	$V_{DS} = 800\text{ V}$ , $I_D = 0.3\text{ A}$ , $T_C = 90^\circ\text{C}$	240		W

### Source-Drain Diode

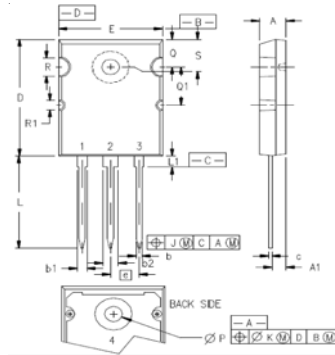
Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)			
		Min.	Typ.	Max.	
$I_S$	$V_{GS} = 0\text{ V}$			17	A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$			30	A
$V_{SD}$	$I_F = I_S$ , $V_{GS} = 0\text{ V}$ , Note 1			1.5	V
$t_{rr}$	$I_F = I_S$ , $-di/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 100\text{ V}$		1350		ns

Note 1: Pulse test,  $t < 300\ \mu\text{s}$ , duty cycle,  $d \leq 2\%$

### ADVANCE 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.

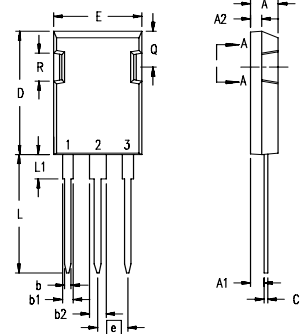
### TO-264 (IXTK) Outline



- 1 - GATE
- 2, 4 - DRAIN (COLLECTOR)
- 3 - SOURCE (EMITTER)

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.209	4.70	5.31
A1	.102	.118	2.59	3.00
b	.037	.055	0.94	1.40
b1	.087	.102	2.21	2.59
b2	.110	.126	2.79	3.20
c	.017	.029	0.43	0.74
D	1.007	1.047	25.58	26.59
E	.760	.799	19.30	20.29
e	.215 BSC		5.46 BSC	
J	.000	.010	0.00	0.25
K	.000	.010	0.00	0.25
L	.779	.842	19.79	21.39
L1	.087	.102	2.21	2.59
ØP	.122	.138	3.10	3.51
Q	.240	.256	6.10	6.50
Q1	.330	.346	8.38	8.79
ØR	.155	.187	3.94	4.75
ØR1	.085	.093	2.16	2.36
S	.243	.253	6.17	6.43

### PLUS247™ (IXTX) Outline



- Terminals: 1 - Gate
- 2 - Drain (Collector)
- 3 - Source (Emitter)
- 4 - Drain (Collector)

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A <sub>1</sub>	2.29	2.54	.090	.100
A <sub>2</sub>	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b <sub>1</sub>	1.91	2.13	.075	.084
b <sub>2</sub>	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	0.244
R	4.32	4.83	.170	.190

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

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

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	7,157,338 B2
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	