

IXYS

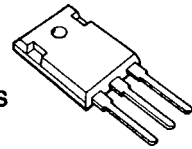
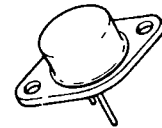
MAXIMUM RATINGS

P-CHANNEL MOSFETS

IXTH20P25

IXTM20P25

20 AMPS, 250V, 0.24 OHMS

IXTH SERIES
TO-247
(TO-3P)IXTM SERIES
TO-204AA
(TO-3)

Parameter	Sym.	IXTH20P25 IXTM20P25	Unit *
Drain-Source Voltage (1)	V_{DS}	250	V_{dc}
Drain-Gate Voltage ($R_{GS} = 1.0M\Omega$) (1)	V_{DGR}	250	V_{dc}
Gate-Source Voltage Continuous	V_{GS}	± 20	V_{dc}
Gate-Source Voltage Transient	V_{GSM}	± 30	V
Drain Current Continuous ($T_C = 25^\circ C$)	I_D	20	A_{dc}
Drain Current Pulsed (3)	I_{DM}	80	A
Total Power Dissipation	P_D	200	W
Power Dissipation Derating $> 25^\circ C$		1.6	W/ $^\circ C$
Operating and Storage Temperature	T_J & T_{stg}	-65 to $+150$	$^\circ C$
Thermal Resistance	R_{thJC}	0.625	$^\circ C/W$
Max. Lead Temp. for Soldering	T_L	300 (1.6mm from case for 10 sec.)	$^\circ C$

* ALL VOLTAGES AND CURRENTS ARE NEGATIVE UNLESS OTHERWISE SPECIFIED

ELECTRICAL CHARACTERISTICS $T_C = 25^\circ C$ unless otherwise specified

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
$V_{(BR)DSS}$ Drain-Source Breakdown Voltage	20P25	250	—	—	V	$V_{GS} = 0V$
	—	—	—	—	V	$I_D = 250\mu A$
$V_{GS(th)}$ Gate Threshold Voltage	ALL	2.0	—	4.5	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$
I_{GSS} Gate-Source Leakage	ALL	—	—	100	nA	$V_{GS} = \pm 20V$
I_{DSS} Zero Gate Voltage Drain Current	ALL	—	—	200	μA	$V_{DS} = 0.8 BV_{DSS}$, $V_{GS} = 0V$
		—	—	1000	μA	$V_{DS} = 0.8 BV_{DSS}$, $V_{GS} = 0V$, $T_C = 125^\circ C$
$R_{DS(on)}$ Static Drain-Source On-State Resistance (2)	ALL	—	—	0.24	Ω	$V_{GS} = 10V$, $I_D = 0.5 I_D$ Max.
g_{FS} Forward Transconductance (2)	ALL	6	7	—	S	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$, $I_D = 0.5 I_D$ Max.
C_{iss} Input Capacitance	ALL	—	—	4300	pF	$V_{GS} = 0V$, $V_{DS} = 25V$, $f = 1.0$ MHz
C_{oss} Output Capacitance	ALL	—	—	1100	pF	
C_{rss} Reverse Transfer Capacitance	ALL	—	—	430	pF	
$t_{d(on)}$ Turn-On Delay Time	ALL	—	—	—	ns	$V_{DD} = 0.5 BV_{DSS}$, $I_D = 0.5 I_D$ Max. $Z_O = 50\Omega$
t_r Rise Time	ALL	—	—	—	ns	
$t_{d(off)}$ Turn-Off Delay Time	ALL	—	—	—	ns	
t_f Fall Time	ALL	—	—	—	ns	
Q_g Total Gate Charge (Gate-Source Plus Gate-Drain)	ALL	—	—	210	nC	$V_{GS} = 10V$, $I_D = I_D$ Max., $V_{DS} = 0.8 BV_{DSS}$
Q_{gs} Gate Source Charge	ALL	—	46	—	nC	
Q_{gd} Gate-Drain ("Miller") Charge	ALL	—	92	—	nC	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS $T_C = 25^\circ C$ unless otherwise specified

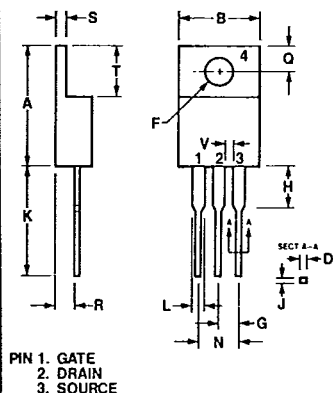
I_S	Continuous Source Current (Body Diode)	ALL	—	—	20	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier.	
I_{SM}	Pulse Source Current (Body Diode) (1)	ALL	—	—	80	A		
V_{SD}	Diode Forward Voltage (2)	ALL	—	—	1.5	V	$I_F = I_S, V_{GS} = 0V$	
t_{rr}	Reverse Recovery Time	ALL	—	350	—	ns	$V_R = 100V$	
Q_{rr}	Reverse Recovery Charge	ALL	—	3.0	—	μC	$T_J = 25^{\circ}C$	$I_F = I_S$ $dI_F/dt = 100A/\mu S$
			—	—	—		$T_J = 150^{\circ}C$	

(1) $T_J = 25^\circ C$ to $150^\circ C$ (2) Pulse test: Pulse width $\leq 300\mu S$, duty cycle $\leq 2\%$

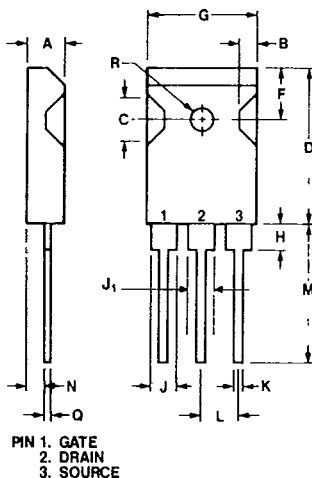
(3) Repetitive rating: Pulse width limited by max. junction temperature.

PACKAGE OUTLINES

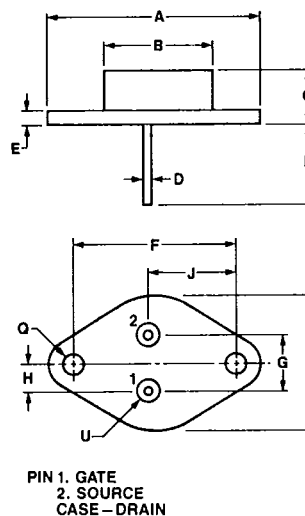
TO-220 AB



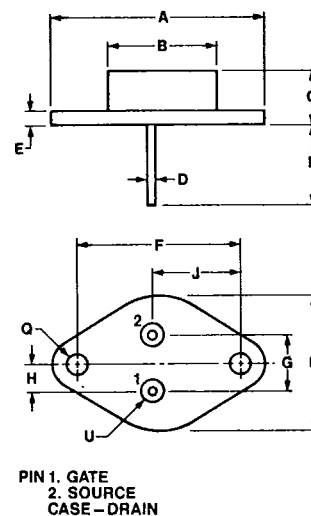
TO-247



TO-204 AC



TO-204 AA



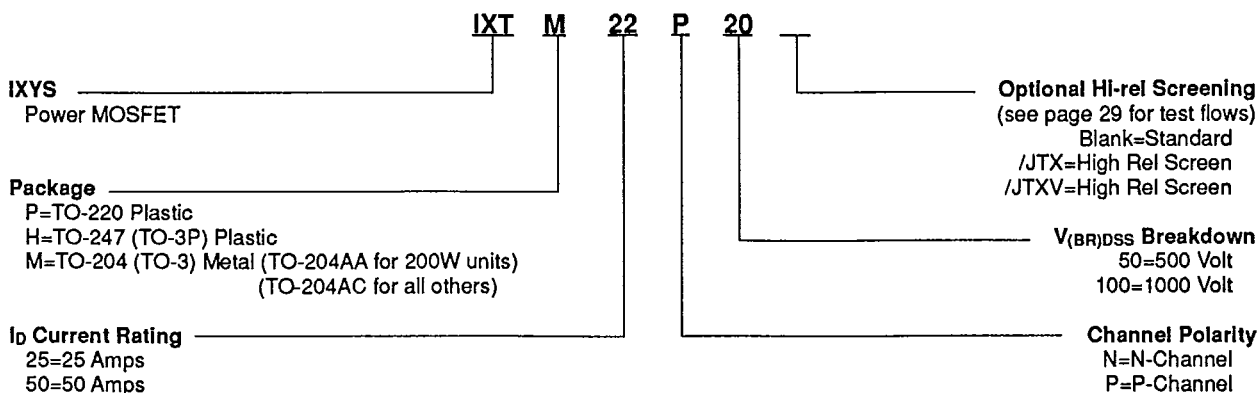
Dim.	Millimeter Min. Max.	Inches Min. Max.
A	14.23 16.51	.560 .650
B	9.66 10.66	.380 .420
C	3.56 4.82	.140 .190
D	0.64 0.89	.025 .035
F	3.54 4.08	.139 .161
G	2.29 2.79	.090 .110
H	— 6.35	— .250
J	0.51 76	.020 .030
K	12.70 14.73	.500 .580
L	1.15 1.77	.045 .070
N	4.83 5.33	.190 .210
Q	2.54 3.42	.100 .135
R	2.04 2.49	.080 .115
S	0.64 1.39	.025 .055
T	5.85 6.85	.230 .270
V	1.15 —	.045 —

Dim.	Millimeters Min. Max.	Inches Min. Max.
A	4.8 5.2	.187 .203
B	1.7 2.7	.067 .106
C	5.1 6.1	.200 .240
D	20.8 21.2	.811 .827
F	5.7 6.3	.224 .248
G	15.7 15.9	.612 .620
H	— 4.5	— .177
J	1.98 2.05	.078 .081
J ₁	2.98 3.03	.117 .119
K	1.18 1.22	.046 .048
L	5.43 1.47	.214 .215
M	18.8 19.2	.740 .756
N	2.2 2.4	.086 .094
Q	.58 .62	.023 .025
R	3.1 3.3	.121 .129

Dim.	Millimeter Min. Max.	Inches Min. Max.
A	— 39.37	— 1.55
B	— 19.71	— .776
C	6.58 6.81	.259 .268
D	0.97 1.09	.038 .043
E	1.40 1.65	.055 .065
F	30.15 BSC	1.187 BSC
G	10.74 11.05	.423 .435
H	5.46 BSC	.215 BSC
J	16.68 17.12	.657 .674
K	11.20 11.98	.441 .472
Q	3.86 4.11	.152 .162
R	24.84 25.27	.978 .995
U	4.19 5.56	.165 .203

Dim.	Millimeter Min. Max.	Inches Min. Max.
A	— 39.37	— 1.55
B	— 19.71	— .776
C	8.96 9.22	.353 .363
D	0.97 1.09	.038 .043
E	2.66 2.92	.105 .115
F	30.15 BSC	1.187 BSC
G	10.74 11.05	.423 .435
H	5.46 BSC	.215 BSC
J	16.68 17.12	.657 .674
K	11.20 11.98	.441 .472
Q	3.86 4.11	.152 .162
R	24.84 25.27	.978 .995
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PART NUMBER DESCRIPTION

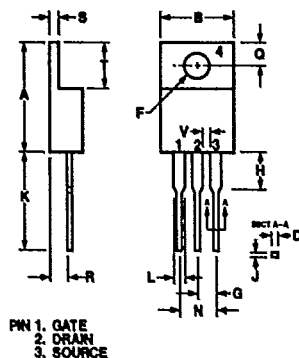


Note: Valid combinations are only those referenced in the IXYS price book or product selector guide. Consult your local IXYS sales office to confirm availability of specific combinations or new types.

DETAILED PACKAGE OUTLINES

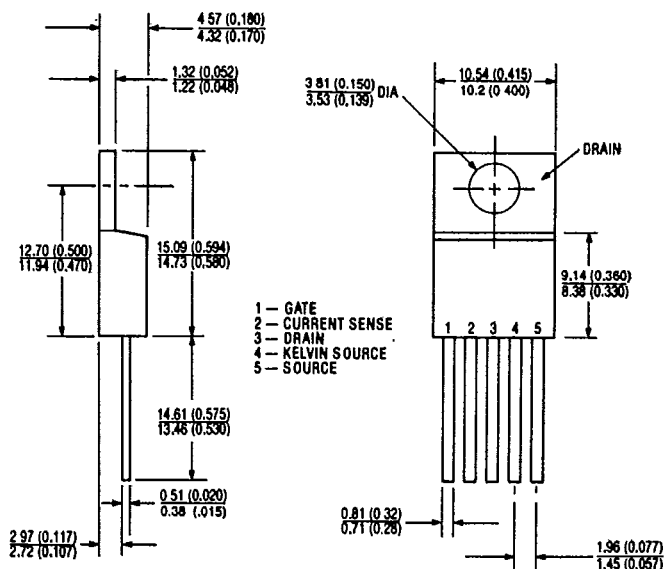
T-91-20

TO-220 AB

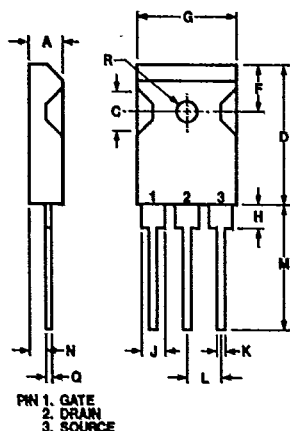


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	14.23	16.51	.560	.650
B	9.66	10.66	.380	.420
C	3.56	4.82	.140	.190
D	0.64	0.89	.025	.035
F	3.54	4.08	.139	.161
G	2.29	2.79	.090	.110
H	—	6.35	—	.250
J	0.51	.76	.020	.030
K	12.70	14.73	.500	.580
L	1.15	1.77	.045	.070
N	4.83	5.33	.190	.210
Q	2.54	3.42	.100	.135
R	2.04	2.49	.080	.115
S	0.64	1.39	.025	.055
T	5.85	6.85	.230	.270
V	1.15	—	.045	—

CONFORMS TO OUTLINE TO-220 (IR H-7)
Dimensions in Millimeters (Inches)

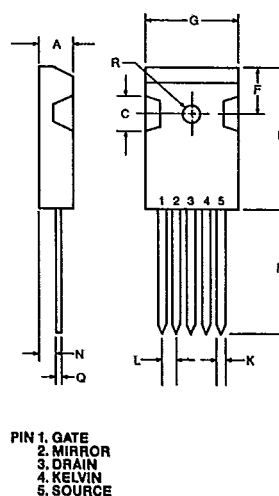


TO-247 (3 LEADED)



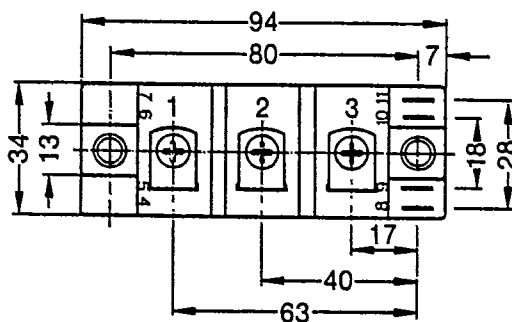
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
H	3.7	4.3	.146	.169
J	1.95	2.4	.077	.094
J ₁	2.97	3.4	.117	.134
K	1.0	1.4	.040	.055
L	5.4	5.5	.213	.217
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4	0.8	.016	.031
R	2.9	3.3	.114	.129

TO-247 (5 LEADED)

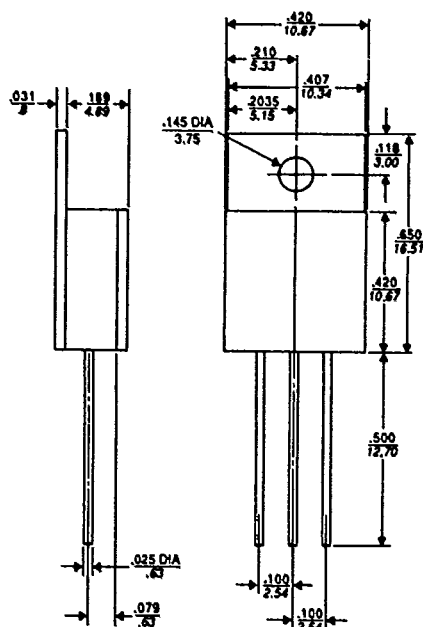


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
K	1.1	1.3	.043	.051
L	2.51	2.56	.099	.101
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4	0.8	.016	.031
R	2.9	3.3	.114	.129

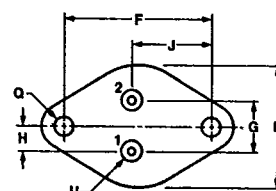
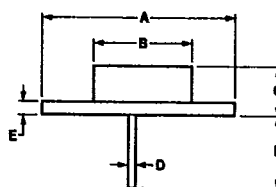
A diagram showing a 2x2 grid of labels: A₂ (top-left), K₁ (top-right), K₂ (bottom-left), and A₁ (bottom-right). To the left of the grid is a crosshair symbol, and to the right is a semi-circle.



TO-220 HERMETIC



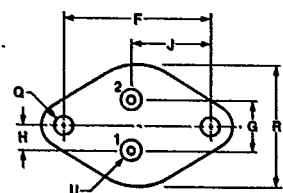
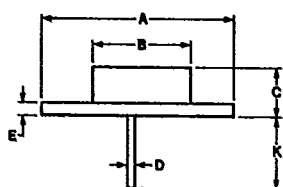
TO-204 AE



PIN 1. GATE
2. SOURCE
CASE - DRAIN

Dim.	Millimeter	Max.	Inches	Max.
A	—	39.37	—	1.55
B	—	19.71	—	.776
C	7.62	10.16	.300	.400
D	1.47	1.57	.058	.062
E	1.52	3.43	.060	.135
F	30.15	BSC	1.187	BSC
G	10.67	11.18	.420	.440
H	5.33	6.10	.210	.240
J	16.68	17.12	.657	.674
K	11.20	11.98	.441	.472
Q	3.86	4.11	.152	.162
R	24.84	25.27	.978	.995

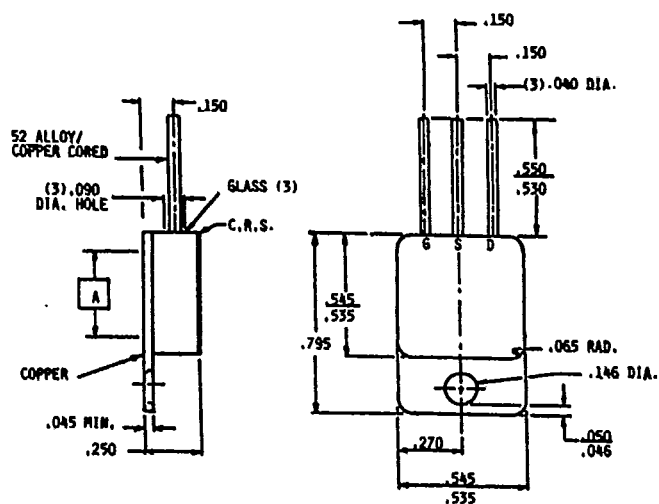
TO-204 AA



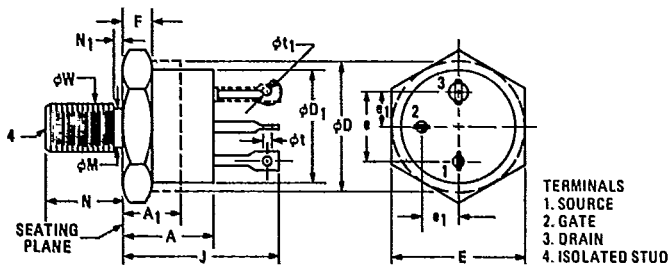
PIN 1. GATE
2. SOURCE
CASE - DRAIN

Dim.	Millimeter	Max.	Inches	Max.
A	—	39.37	—	.155
B	—	19.71	—	.776
C	6.35	8.89	.250	.350
D	.097	1.09	.038	.043
E	—	3.43	—	.135
F	30.15	BSC	1.187	BSC
G	10.67	11.18	.420	.440
H	5.33	6.10	.210	.240
J	16.68	17.12	.657	.674
K	11.20	11.98	.441	.472
Q	3.86	4.11	.152	.162
R	24.84	25.47	.978	1.00

TO-254 HERMETIC



CONFORMS TO JEDEC OUTLINE TO-210AC (TO-61) Dimensions in Millimeters (Inches)



TERMINALS
1. SOURCE
2. GATE
3. DRAIN
4. ISOLATED STUD

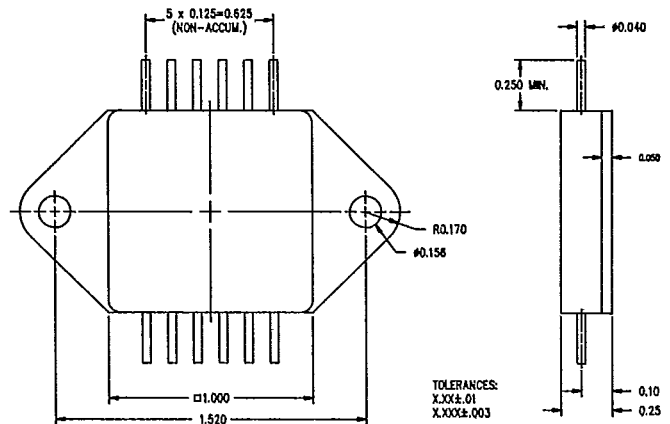
Symbol	Inches Min.	Inches Max.	Millimeters Min.	Millimeters Max.	Notes
A	0.325	0.450	8.26	11.68	
A ₁		0.270		6.86	2
ϕD	0.610	0.687	15.49	17.45	2
ϕD ₁	0.570	0.610	14.48	15.49	
E	0.667	0.687	16.94	17.45	
e	0.340	0.415	8.64	10.54	5
e ₁	0.170	0.213	4.32	5.41	5
F	0.090	0.150	2.29	3.81	1

Symbol	Inches Min.	Inches Max.	Millimeters Min.	Millimeters Max.	Notes
J	0.640	0.875	16.26	22.23	
ϕM	0.220	0.249	5.59	6.32	
N	0.422	0.455	10.72	11.56	
N ₁		0.090		2.29	
ϕt	0.055	0.072	1.19	1.83	
ϕt ₁	0.046	0.077	1.17	1.96	4
ϕW	0.2225	0.2268	5.661	5.761	3

NOTES

1. DIMENSION DOES NOT INCLUDE SEALING FLANGES.
2. PACKAGE CONTOUR OPTIONAL WITHIN DIMENSIONS SPECIFIED.
3. PITCH DIAMETER - THREAD 1/4 28 UNF 2A (COATED).
REFERENCE IS SCREW THREAD STANDARDS FOR FEDERAL SERVICES - HANDBOOK H 281.
4. THIS TERMINAL CAN BE FLATTENED AND PIERCED OR HOOK TYPE.
5. POSITION OF LEADS IN RELATION TO THE HEXAGON IS NOT CONTROLLED.

QUADPAC



Z-Pac

