

IXGP10N50, 60**IXGM10N50, 60**

10 AMPS, 500–600 VOLTS

MAXIMUM RATINGS

Parameter	Sym.	IXGP10N50 IXGM10N50	IXGP10N60 IXGM10N60	Unit
Drain-Source Voltage (1)	V_{DSS}	500	600	V_{dc}
Drain-Gate Voltage ($R_{GS} = 1.0M\Omega$) (1)	V_{DGR}	500	600	V_{dc}
Gate-Source Voltage	V_{GS}	± 30	± 30	V_{dc}
Drain Current Continuous $T_C = 25^\circ C$ $T_C = 90^\circ C$	I_D	20 10	20 10	A_{dc}
Drain Current Peak (3)	I_{DM}	40	40	A_{dc}
Total Power Dissipation @ $25^\circ C$	P_D	100		W
Power Dissipation Derating > $25^\circ C$		0.83		W/ $^\circ C$
Operating and Storage Junction Temperature	T_J & T_{stg}	–65 to +150		$^\circ C$
Thermal Resistance	R_{thJC}	1.2		$^\circ C/W$

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

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS} Drain-Source Breakdown Voltage	10N50, 50A	500	—	—	V	$V_{GS} = 0V$
	10N60, 60A	600	—	—	V	$I_D = 250\mu A$
$V_{GS(th)}$ Gate Threshold Voltage	ALL	2.5	—	5.0	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$
I_{GSS} Gate-Source Leakage	ALL	—	—	100	nA	$V_{GS} = \pm 30V$
I_{DSS} Zero Gate Voltage Drain Current	ALL	—	—	200	μA	$V_{DS} = \text{Max. Rating} \times 0.8$, $V_{GS} = 0V$
		—	—	1000	μA	$V_{DS} = \text{Max. Rating} \times 0.8$, $V_{GS} = 0V$, $T_C = 125^\circ C$
$V_{DS(ON)}$ Drain-Source On Voltage	10N50, 60	—	—	2.5	V	$V_{GS} = 15V$, $I_D = 10A$
	10N50A, 60A	—	—	3.0	V	
G_{fs} Forward Transconductance (2)	ALL	4.0	—	—	S	$V_{DS} = 10V$, $I_D = 5A$
C_{iss} Input Capacitance	ALL	—	—	1200	pF	$V_{GS} = 0V$, $V_{DS} = 25V$, $f = 1.0 \text{ MHz}$
C_{oss} Output Capacitance	ALL	—	—	100	pF	
C_{rss} Reverse Transfer Capacitance	ALL	—	—	30	pF	

SWITCHING CHARACTERISTICS**RESISTIVE LOAD**

$t_{d(on)}$ Turn-On Delay Time	ALL	—	—	100	ns	Resistive Load, $T_J = 125^\circ C$ $I_D = 10A$, $V_{DS} = \text{Rated } V_{DSS} \times 0.8$ $V_{GS} = 15V$ $R_{GS} = 100\Omega$
t_r Current Rise Time	ALL	—	—	200	ns	
$t_{d(off)}$ Turn-Off Delay Time	ALL	—	—	500	ns	
t_f Current Fall Time	10N50, 60	—	—	1.5	μs	
	10N50A, 60A	—	—	0.5	μs	

INDUCTIVE LOAD

$t_{d(off)}$ Turn-Off Delay Time	ALL	—	—	500	ns	Inductive Load, $T_J = 125^\circ C$ $L = 100 \mu H$, $I_D = 10A$ $V_{DS}(\text{Clamp}) = \text{Rated } V_{DSS} \times 0.8$ $V_{GS} = 15V$, $R_{GS} = 100\Omega$
t_f Current Fall Time	10N50, 60	—	—	2.0	μs	
	10N50A, 60A	—	—	0.6	μs	

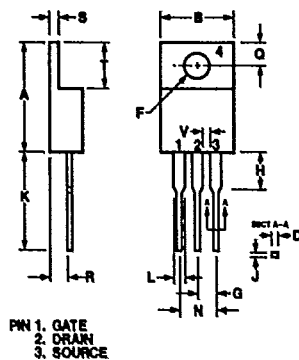
(1) $T_J = 25^\circ C$ to $150^\circ C$ (2) Pulse Test: Pulse width $\leq 300ms$, duty cycle $\leq 2\%$

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

DETAILED PACKAGE OUTLINES

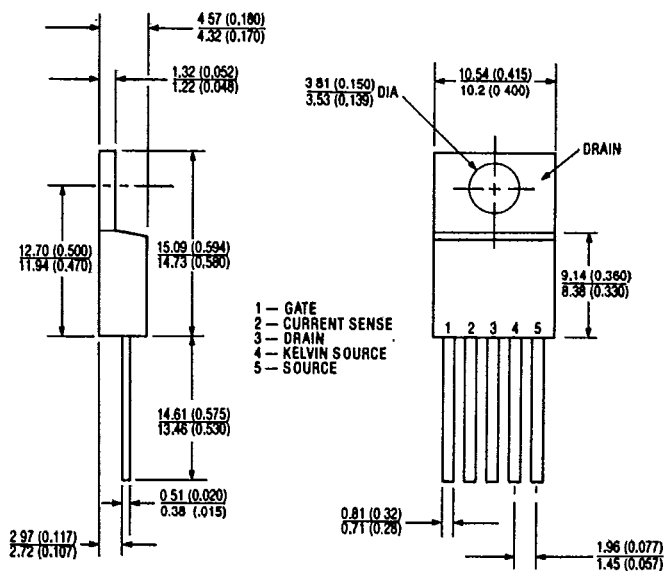
T-91-20

TO-220 AB

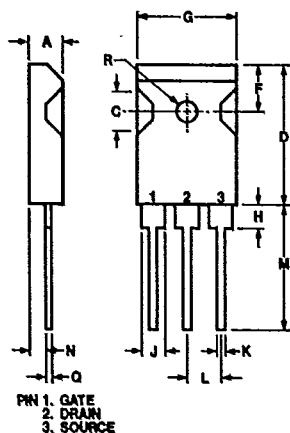


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	14.23	16.51	.560	.650
B	9.66	10.66	.380	.420
C	3.56	4.82	.140	.190
D	0.64	0.89	.025	.035
F	3.54	4.08	.139	.161
G	2.29	2.79	.090	.110
H	—	6.35	—	.250
J	0.51	.76	.020	.030
K	12.70	14.73	.500	.580
L	1.15	1.77	.045	.070
N	4.83	5.33	.190	.210
Q	2.54	3.42	.100	.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)

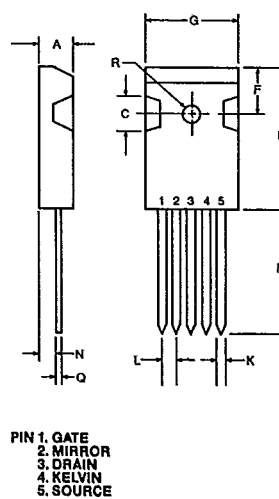


TO-247 (3 LEADED)



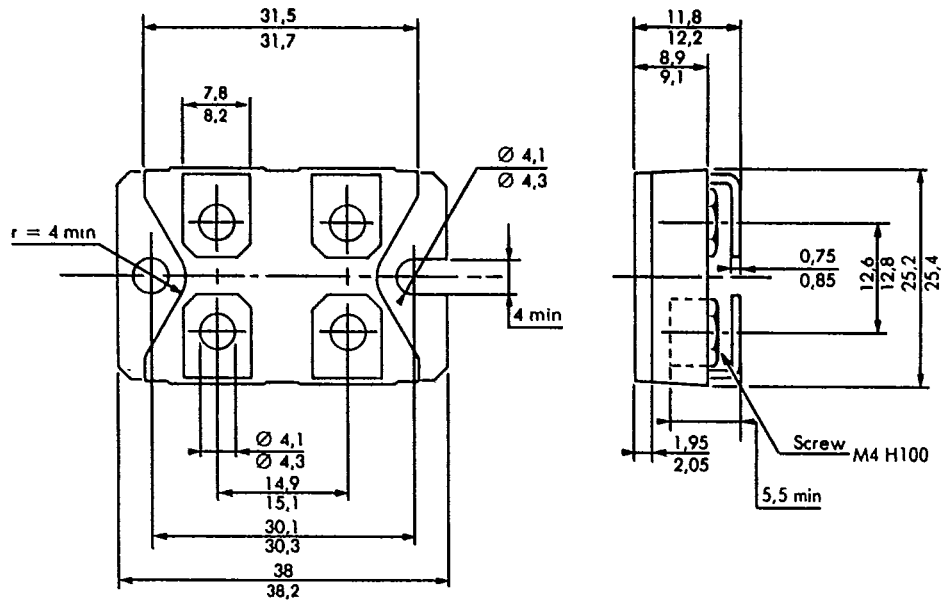
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
H	3.7	4.3	.146	.169
J	1.95	2.4	.077	.094
J ₁	2.97	3.4	.117	.134
K	1.0	1.4	.040	.055
L	5.4	5.5	.213	.217
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4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

TO-247 (5 LEADED)

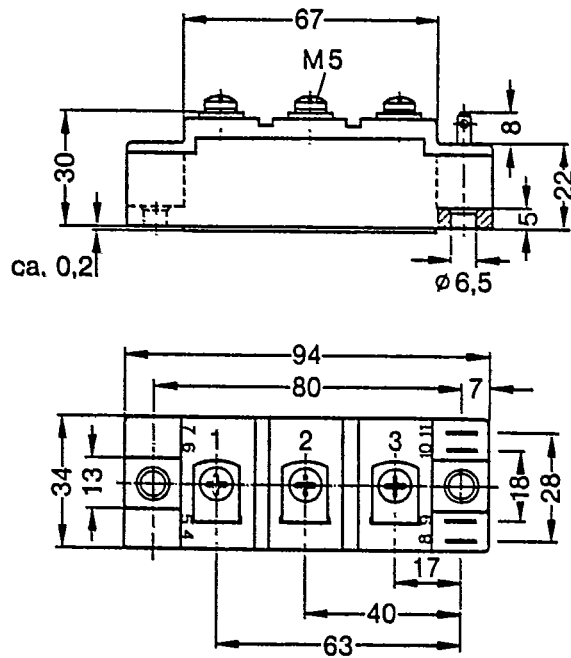


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
K	1.1	1.3	.043	.051
L	2.51	2.56	.099	.101
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4	0.8	.016	.031
R	2.9	3.3	.114	.129

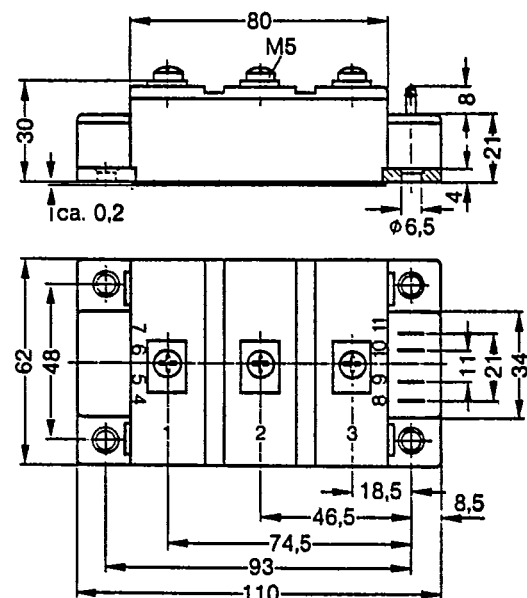
TO-238
Dimensions in Millimeters



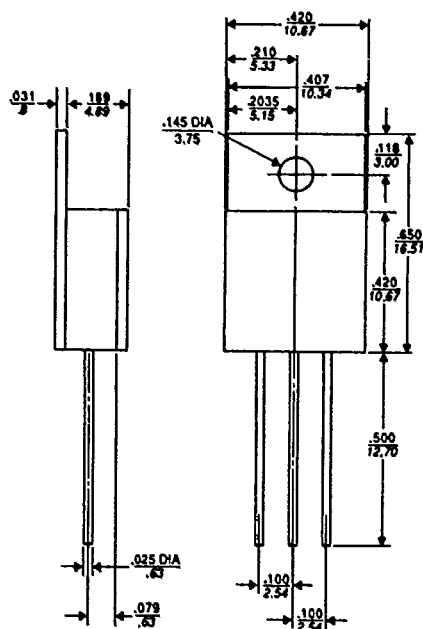
Y-4
Dimensions in Millimeters



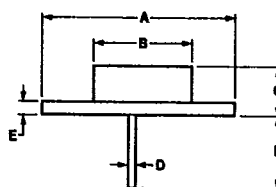
Y-3
Dimensions in Millimeters



TO-220 HERMETIC



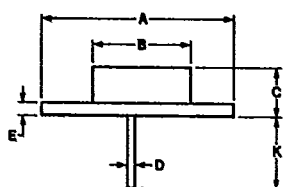
TO-204 AE



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

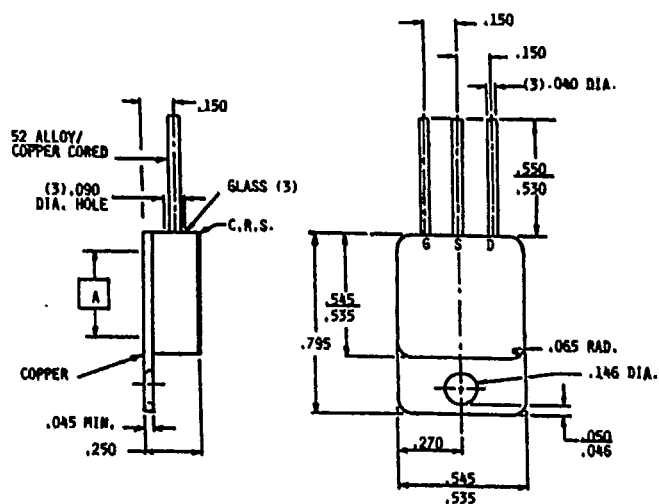
TO-204 AA



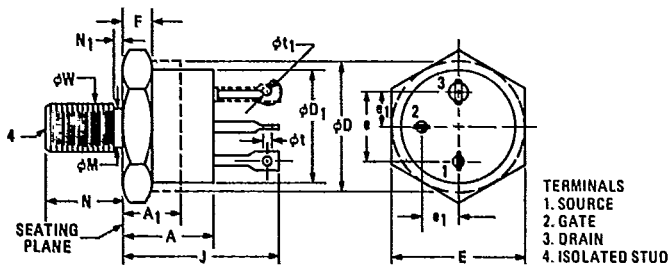
PIN 1. GATE
2. SOURCE
CASE - DRAIN

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

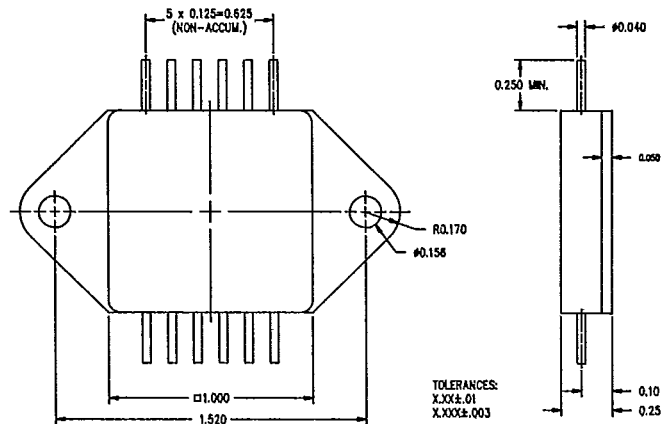
Symbol	Inches	Millimeters	Notes
A	0.325	8.26	11.68
A ₁	0.270	6.86	2
ϕD	0.610	15.49	17.45
ϕD ₁	0.570	14.48	15.49
E	0.667	16.94	17.45
e	0.340	8.64	10.54
e ₁	0.170	4.32	5.41
F	0.090	2.29	3.81

Symbol	Inches	Millimeters	Notes
J	0.640	16.26	22.23
ϕM	0.220	5.59	6.32
N	0.422	10.72	11.56
N ₁	0.090	2.29	
ϕt	0.055	1.19	1.83
ϕt ₁	0.046	1.17	1.96
ϕW	0.2225	5.661	5.761

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

