

**IXGH30N50, 60**  
**IXGM30N50, 60**  
 30 AMPS, 500–600 VOLTS

**MAXIMUM RATINGS**

Parameter	Sym.	IXGH30N50 IXGM30N50	IXGH30N60 IXGM30N60	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	$V_{GS}$	$\pm 30$	$\pm 30$	$V_{dc}$
Drain Current Continuous	$I_D$	50 30	50 30	$A_{dc}$
		$T_C = 25^\circ C$		
		$T_C = 90^\circ C$		
Drain Current Peak (3)	$I_{DM}$	100	100	$A_{dc}$
Total Power Dissipation ( $\mu 25^\circ C$ )	$P_D$		200	W
Power Dissipation Derating $> 25^\circ C$			1.67	$W/^\circ C$
Operating and Storage Junction Temperature	$T_J$ & $T_{stg}$		-65 to +150	$^\circ C$
Thermal Resistance	$R_{thJC}$		0.6	$^\circ C/W$

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

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
$BV_{DSS}$ Drain-Source Breakdown Voltage	30N50, 50A	500	—	—	V	$V_{GS} = 0V$ $I_D = 250\mu A$
	30N60, 60A	600	—	—	V	
$V_{GS(th)}$ 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	$\mu A$	$V_{DS} = \text{Max. Rating} \times 0.8$ , $V_{GS} = 0V$
		—	—	1000	$\mu A$	$V_{DS} = \text{Max. Rating} \times 0.8$ , $V_{GS} = 0V$ , $T_C = 125^\circ C$
$V_{DS(ON)}$ Drain-Source On Voltage	30N50, 60	—	—	2.5	V	$V_{GS} = 15V$ , $I_D = 30A$
	30N50A, 60A	—	—	3.0	V	
$G_{fs}$ Forward Transconductance (2)	ALL	8.0	—	—	S	$V_{DS} = 10V$ , $I_D = 15A$
$C_{iss}$ Input Capacitance	ALL	—	—	3500	pF	$V_{GS} = 0V$ , $V_{DS} = 25V$ , $f = 1.0$ MHz
$C_{oss}$ Output Capacitance	ALL	—	—	250	pF	
$C_{rss}$ Reverse Transfer Capacitance	ALL	—	—	50	pF	

**SWITCHING CHARACTERISTICS****RESISTIVE LOAD**

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
$t_{d(on)}$ Turn-On Delay Time	ALL	—	—	100	ns	Resistive Load, $T_J = 125^\circ C$ $I_D = 30A$ , $V_{DS} = \text{Rated } V_{DSS} \times 0.8$ $V_{GS} = 15V$ $R_{GS} = 100\Omega$
$t_r$ Current Rise Time	ALL	—	—	200	ns	
$t_{d(off)}$ Turn-Off Delay Time	ALL	—	—	1.0	$\mu s$	
$t_f$ Current Fall Time	30N50, 60	—	—	2.0	$\mu s$	
	30N50A, 60A	—	—	0.5	$\mu s$	

**INDUCTIVE LOAD**

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
$t_{d(off)}$ Turn-Off Delay Time	ALL	—	—	1.0	$\mu s$	Inductive Load, $T_J = 125^\circ C$ $L = 100 \mu H$ , $I_D = 30A$ $V_{DS}(\text{Clamp}) = \text{Rated } V_{DSS} \times 0.8$ $V_{GS} = 15V$ , $R_{GS} = 100\Omega$
$t_f$ Current Fall Time	30N50, 60	—	—	3.0	$\mu s$	
	30N50A, 60A	—	—	0.8	$\mu s$	

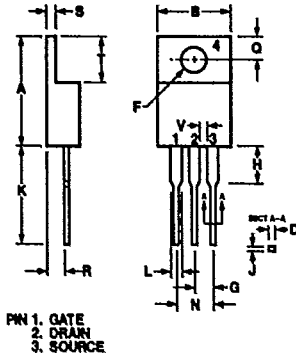
(1)  $T_J = 25^\circ C$  to  $150^\circ C$ (2) Pulse Test: Pulse width  $\leq 300ms$ , duty cycle  $\leq 2\%$ 

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

# DETAILED PACKAGE OUTLINES

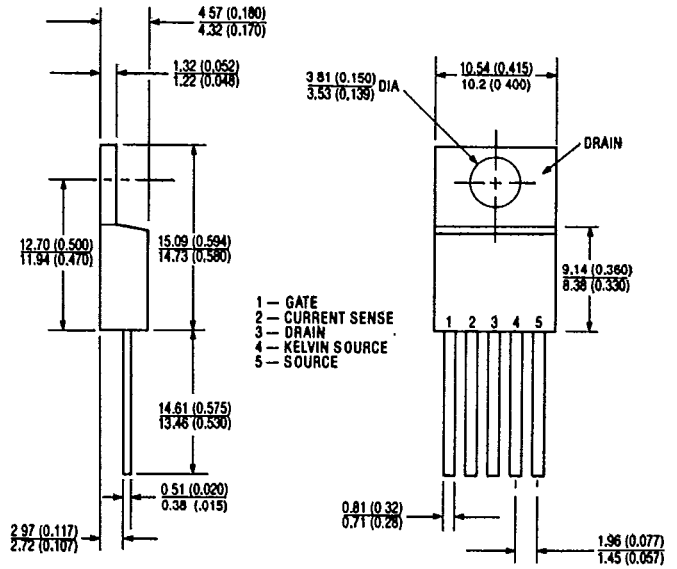
T-91-20

**TO-220 AB**

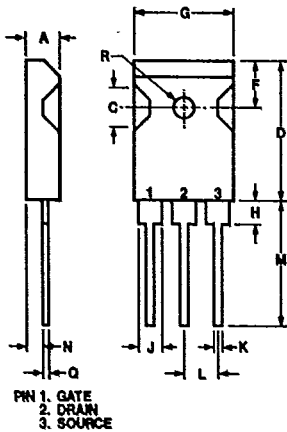


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	14.23	16.51	.560	.650
B	9.66	10.66	.380	.420
C	3.56	4.82	.140	.190
D	0.64	0.89	.025	.035
F	3.54	4.08	.139	.161
G	2.29	2.79	.090	.110
H	-	6.35	-	.250
J	0.51	.76	.020	.030
K	12.70	14.73	.500	.580
L	1.15	1.77	.045	.070
N	4.83	5.33	.190	.210
Q	2.54	3.42	.100	.135
R	2.04	2.49	.080	.115
S	0.64	1.39	.025	.055
T	5.85	6.85	2.30	2.70
V	1.15	-	.045	-

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

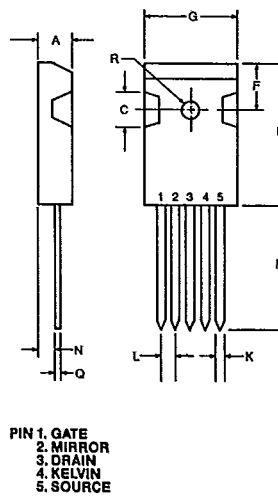


**TO-247 (3 LEADED)**



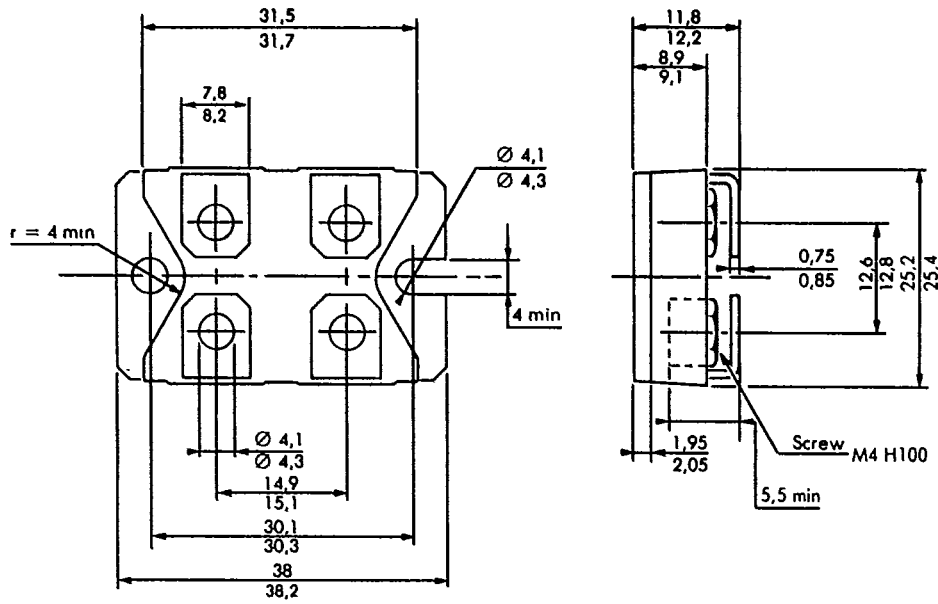
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
H	3.7	4.3	.146	.169
J	1.95	2.4	.077	.094
J <sub>1</sub>	2.97	3.4	.117	.134
K	1.0	1.4	.040	.055
L	5.4	5.5	.213	.217
M	19.9	20.2	.783	.795
N	2.2	2.6	.087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

**TO-247 (5 LEADED)**

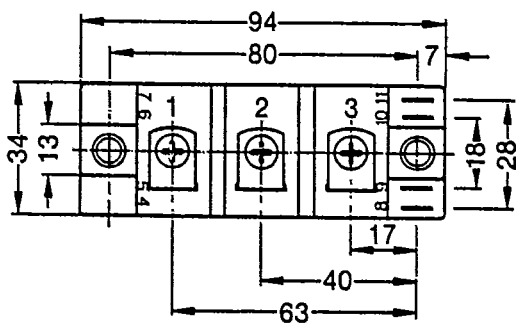
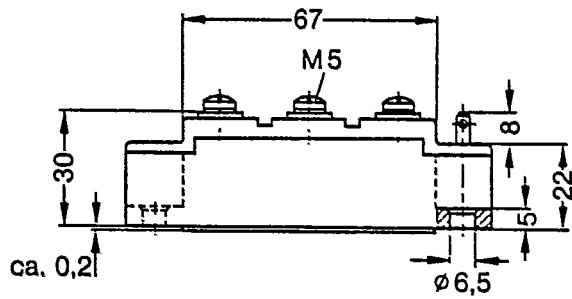


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
K	1.1	1.3	.043	.051
L	2.51	2.56	.099	.101
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4	0.8	.016	.031
R	2.9	3.3	.114	.129

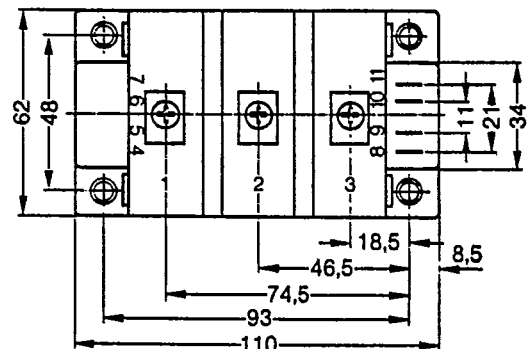
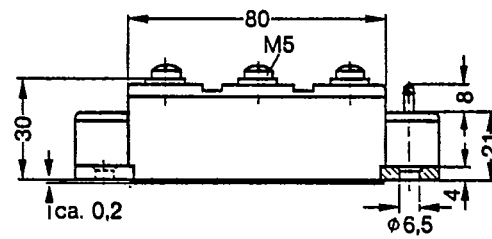
**TO-238**  
Dimensions in Millimeters



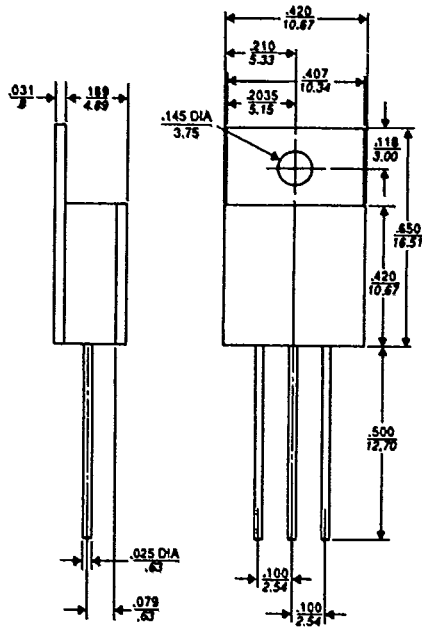
**Y-4**  
Dimensions in Millimeters



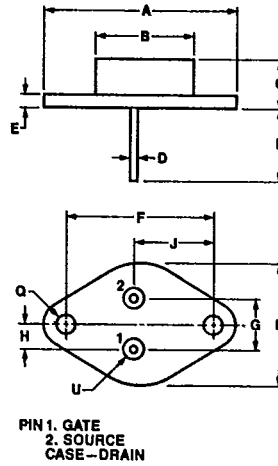
**Y-3**  
Dimensions in Millimeters



TO-220 HERMETIC

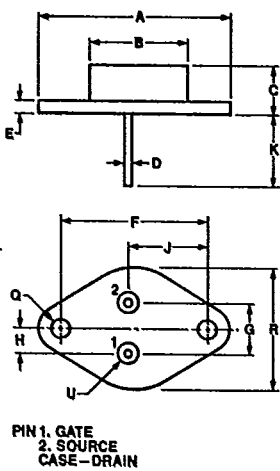


TO-204 AE



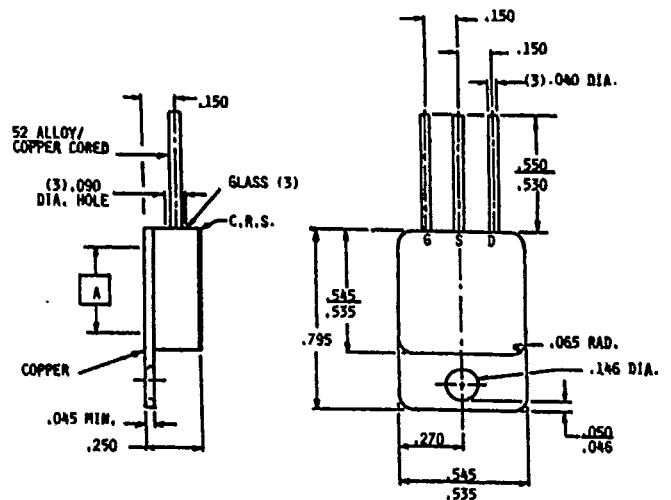
Dim.	Millimeter	Max.	Inches	Max.
A	—	39.37	—	1.55
B	—	19.71	—	.776
C	7.62	10.16	.300	.400
D	1.47	1.57	.058	.062
E	1.52	3.43	.060	.135
F	30.15	BSC	1.187	BSC
G	10.67	11.18	.420	.440
H	5.33	6.10	.210	.240
J	16.68	17.12	.657	.674
K	11.20	11.98	.441	.472
Q	3.86	4.11	.152	.162
R	24.84	25.27	.978	.995

TO-204 AA

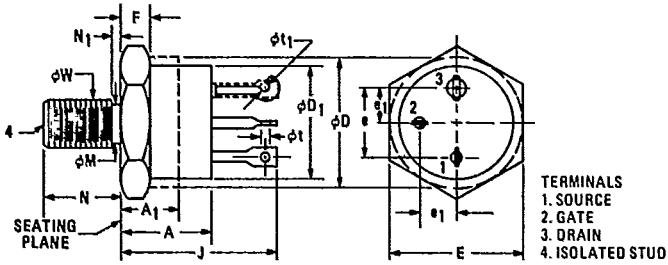


Dim.	Millimeter	Max.	Inches	Max.
A	—	39.37	—	.155
B	—	19.71	—	.776
C	6.35	8.89	.250	.350
D	.097	1.09	.038	.043
E	—	3.43	—	.135
F	30.15	BSC	1.187	BSC
G	10.67	11.18	.420	.440
H	5.33	6.10	.210	.240
J	16.68	17.12	.657	.674
K	11.20	11.98	.441	.472
Q	3.86	4.11	.152	.162
R	24.84	25.47	.978	1.00

TO-254 HERMETIC



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



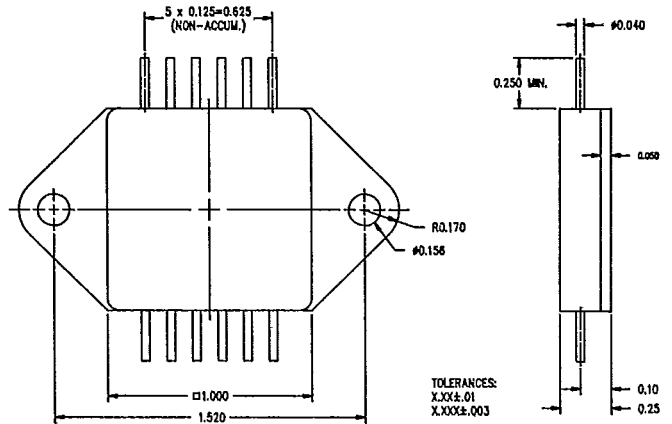
TERMINALS  
 1. SOURCE  
 2. GATE  
 3. DRAIN  
 4. ISOLATED STUD

Symbol	Inches		Millimeters		Notes
	Min.	Max.	Min.	Max.	
A	0.325	0.450	8.26	11.68	
A <sub>1</sub>	0.270		6.86		2
φD	0.610	0.687	15.49	17.45	2
φD <sub>1</sub>	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 <sub>1</sub>	0.170	0.213	4.32	5.41	5
F	0.090	0.150	2.29	3.81	1

Symbol	Inches		Millimeters		Notes
	Min.	Max.	Min.	Max.	
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 <sub>1</sub>		0.090		2.29	
φt	0.055	0.072	1.19	1.83	
φt <sub>1</sub>	0.046	0.077	1.17	1.96	4
φW	0.2225	0.2768	5.561	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 ISCREW 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**

