

Hi-Rel MODULES and PACKAGES

T-39-90

IXYS has made a major commitment to serve the military and aerospace industry with advanced power technology. Besides developing a superior fourth generation rugged process called HDMOS, IXYS has also invested significant resources in Hi-Rel power packaging. Our approach is to retain *total control* over the semiconductor and packaging elements of IXYS Hi-Rel products. This combined capability allows IXYS to achieve the highest standards of quality and reliability, while providing innovative new products for Hi-Rel applications.

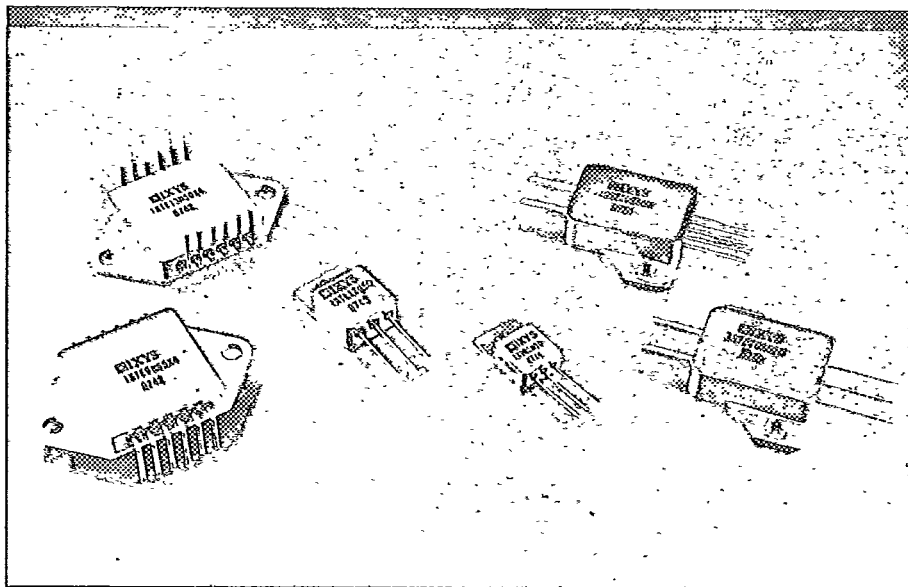
To assure these standards, we have equipped our in-house Hi-Rel assembly and test facility to satisfy the requirements of MIL-S-19500 and MIL-M-38510. It is capable of producing both hermetic discrete and hybrid power modules.

IXYS has a seasoned team of packaging, process and chip design engineers focused on developing advanced Hi-Rel products for military and aerospace programs. We are uniquely qualified to satisfy a broad range of requirements ranging from standard packages to custom power hybrid modules.

Z-Pac™—A New Standard In Power Packaging

IXYS has established its leadership in developing a new standard in Hi-Rel power packaging. The Z-Pac is designed to match a TO-204 (TO-3) mounting footprint while offering internal isolation and much higher power handling capability. This unique package outline reduces board space by allowing two or more devices to be mounted closer together than TO-204 packaged devices.

The Z-Pac has two 70 mil copper core power leads on one side and from three to five 25 mil copper leads



The new hermetic Z-Pacs, QUADPAC Modules, TO-220H and TO-254.

for driver and signal connections on the other side. This RF style approach allows the designer to decouple the drive and load currents for improved performance at high frequency. The internal cavity is large enough to incorporate power chips up to 300 square millimeters. IXYS is offering both its discrete MegaMOS FETs and MOSIGBTs in the Z-Pac as standard products. The Z-Pac is also available to meet custom requirements.

QUADPAC™ Power MOSFET Modules

The QUADPAC family of Hi-Rel modules contain four independent Power MOSFETs in a compact 12-pin package. This module package has an all copper isolated baseplate and is designed to meet the highest military standards for mechanical and electrical reliability in ground based, airborne, and space applications. IXYS offers the ruggedized N-channel MOSFETs in the QUADPAC at voltage ratings to 650 volts. For other higher power applications, IXYS is expanding its family of QUADPAC modules to incorporate MegaMOS FETs and MOSIGBTs.

Custom Power Modules

IXYS provides a total in-house capability to design, develop, manufacture and test power modules to meet specific customer requirements. Having semiconductor technology and power packaging under one roof gives us the ability to "optimize" both the package and device for a superior module design.

Quadpac MOSFETs (4 Independent N-channel FETs)

Part Number	Drain-Source Voltage $V_{(BR)DSS}$ (Volts)	Drain Current $I_D @ 25^\circ C$ (Amps)	On Resistance $R_{DS(on)}$ (Ohms)		Power Diss. P_D Max (Watts)	Circuit Configuration	Case Style
			N-Ch	P-Ch			
IXTE9N65X4U	650	9	0.7		125		Quadpac
IXTE14N60X4U	600	14	0.4		175		
IXTE10N60X4U	600	10	0.55		125		
IXTE18N50X4U	500	18	0.25		175		
IXTE12N50X4U	500	12	0.4		125		
IXTE14N40X4U	400	14	0.3		125		
IXTE25N20X4U	200	25	0.1		125		
IXTE25N10X4U	100	25	0.065		125		

Quadpac MOSFETs (complementary N and P-channel FETs)

Part Number	Drain-Source Voltage $V_{(BR)DSS}$ (Volts)	Drain Current $I_D @ 25^\circ C$ (Amps)	On Resistance $R_{DS(on)}$		Power Diss. P_D Max (Watts)	Circuit Configuration	Case Style
			N-Ch	P-Ch			
IXTE7C65X4U	650	7	0.7	1.4	125		Quadpac
IXTE8C60X4U	600	8	0.55	1.1	125		
IXTE10C50X4U	500	10	0.4	0.8	125		
IXTE10C40X4U	400	10	0.3	0.75	125		
IXTE22C20X4U	200	22	0.1	0.2	125		
IXTE25C10X4U	100	25	0.065	0.08	125		

Z-Pac MOSIGBTs (with internal fast recovery rectifiers)

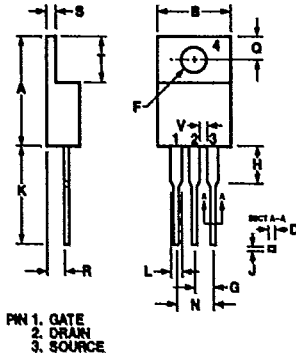
Part Number	Collector-Emitter Voltage V_{CES} (Volts)	Collector Current $I_C @ 25^\circ C$ (Amps)	Collector-Emitter Sat. Volt. $V_{CE(sat)}$ (Volts)	Power Diss. P_C Max (Watts)	Circuit Configuration	Case Style
IXGE75N100Z	1000	75	3.7	250		Z-Pac
IXGE50N100Z	1000	50	3.5	200		
IXGE75N90Z	900	75	3.7	250		
IXGE50N90Z	900	50	3.5	200		
IXGE75N80Z	800	75	3.7	250		
IXGE50N80Z	800	50	3.5	200		
IXGE75N60Z	600	75	3.2	250		
IXGE50N60Z	600	50	3.0	200		
IXGE75N50Z	500	75	3.2	250		
IXGE50N50Z	500	50	3.0	200		

Note: Quadpacs available in three different lead configurations.

DETAILED PACKAGE OUTLINES

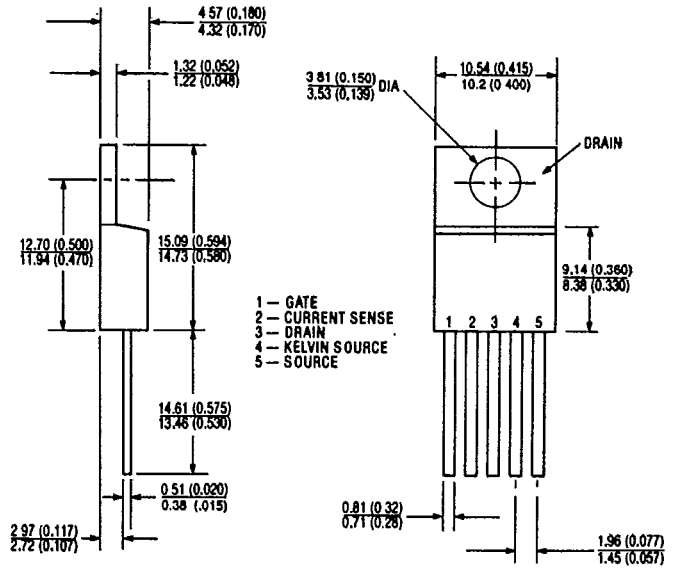
T-91-20

TO-220 AB

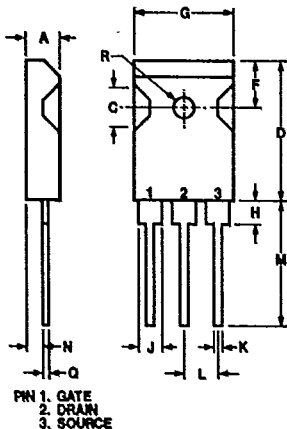


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	14.23	16.51	.560	.650
B	9.66	10.66	.380	.420
C	3.56	4.82	.140	.190
D	0.64	0.89	.025	.035
F	3.54	4.08	.139	.161
G	2.29	2.79	.090	.110
H	-	6.35	-	.250
J	0.51	.76	.020	.030
K	12.70	14.73	.500	.580
L	1.15	1.77	.045	.070
N	4.83	5.33	.190	.210
Q	2.54	3.42	.100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

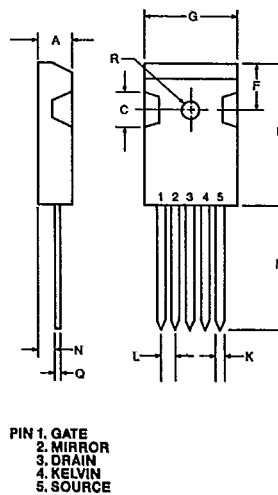


TO-247 (3 LEADED)



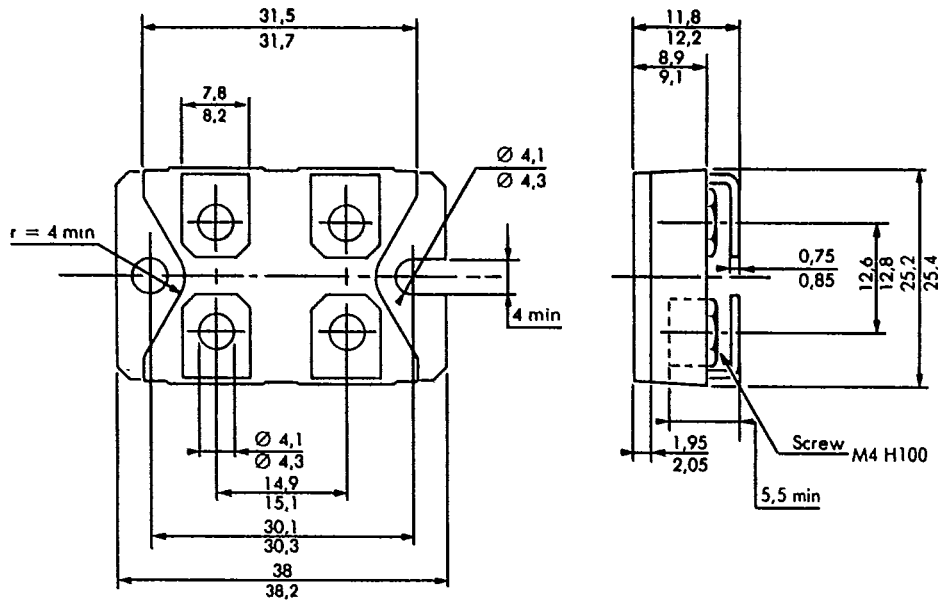
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
H	3.7	4.3	.146	.169
J	1.95	2.4	.077	.094
J ₁	2.97	3.4	.117	.134
K	1.0	1.4	.040	.055
L	5.4	5.5	.213	.217
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4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

TO-247 (5 LEADED)

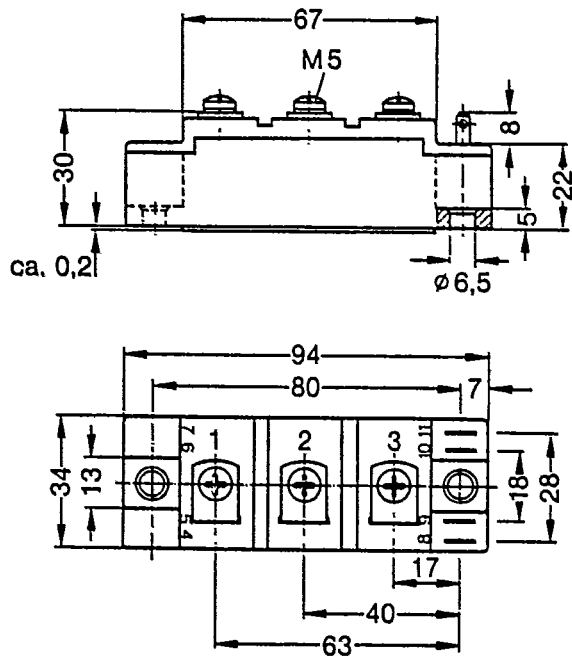


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
K	1.1	1.3	.043	.051
L	2.51	2.56	.099	.101
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4	0.8	.016	.031
R	2.9	3.3	.114	.129

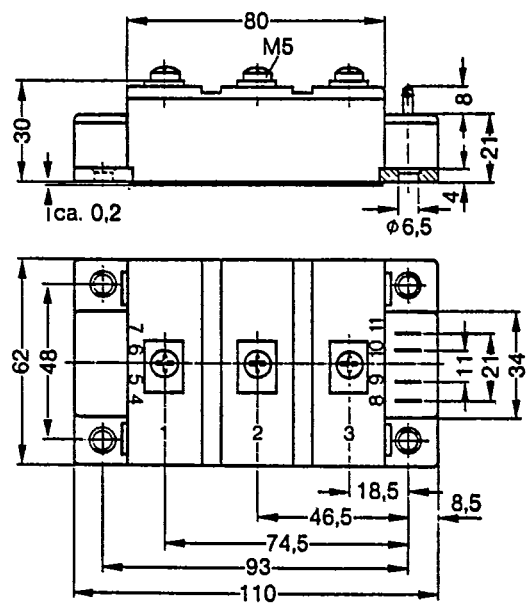
TO-238
Dimensions in Millimeters



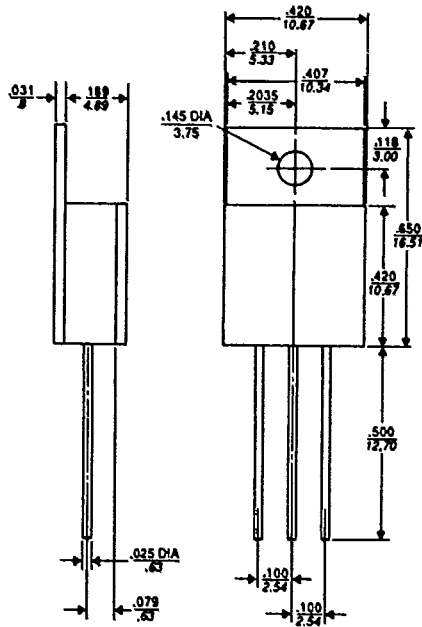
Y-4
Dimensions in Millimeters



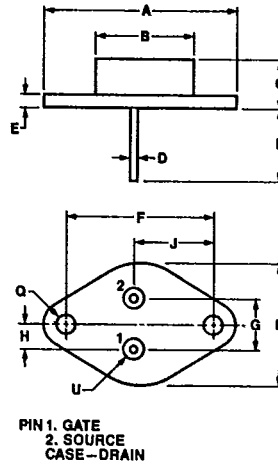
Y-3
Dimensions in Millimeters



TO-220 HERMETIC

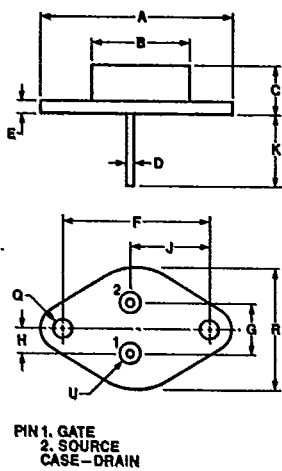


TO-204 AE



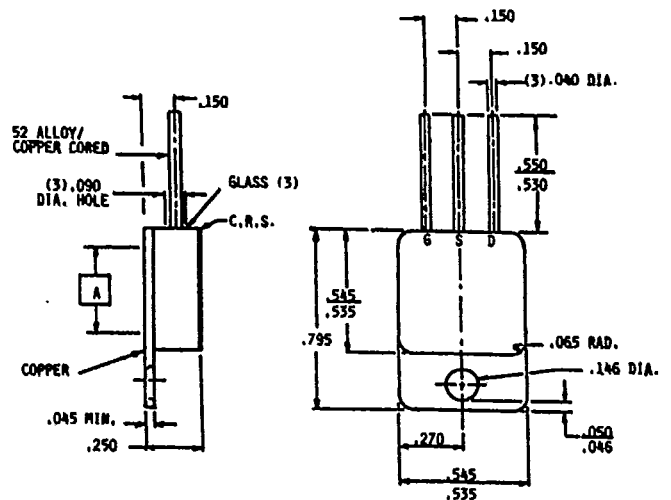
Dim.	Millimeter	Max.	Inches	Max.
A	—	39.37	—	1.55
B	—	19.71	—	.776
C	7.62	10.16	.300	.400
D	1.47	1.57	.058	.062
E	1.52	3.43	.060	.135
F	30.15	BSC	1.187	BSC
G	10.67	11.18	.420	.440
H	5.33	6.10	.210	.240
J	16.68	17.12	.657	.674
K	11.20	11.98	.441	.472
Q	3.86	4.11	.152	.162
R	24.84	25.27	.978	.995

TO-204 AA

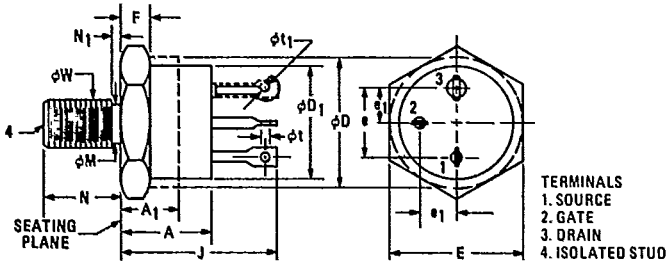


Dim.	Millimeter	Max.	Inches	Max.
A	—	39.37	—	.155
B	—	19.71	—	.776
C	6.35	8.89	.250	.350
D	.097	1.09	.038	.043
E	—	3.43	—	.135
F	30.15	BSC	1.187	BSC
G	10.67	11.18	.420	.440
H	5.33	6.10	.210	.240
J	16.68	17.12	.657	.674
K	11.20	11.98	.441	.472
Q	3.86	4.11	.152	.162
R	24.84	25.47	.978	1.00

TO-254 HERMETIC



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



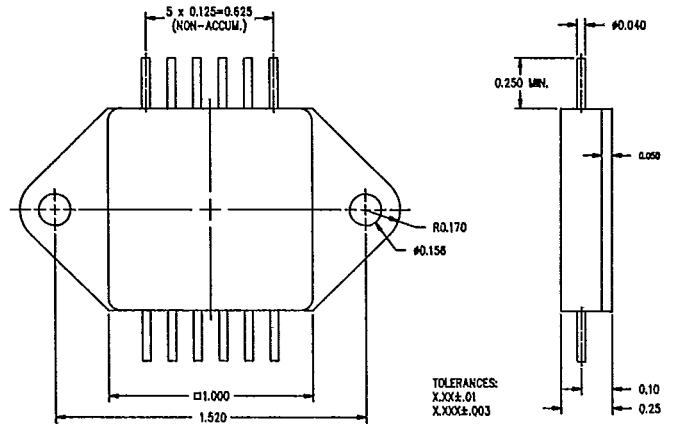
TERMINALS
 1. SOURCE
 2. GATE
 3. DRAIN
 4. ISOLATED STUD

Symbol	Inches		Millimeters		Notes
	Min.	Max.	Min.	Max.	
A	0.325	0.450	8.26	11.68	
A 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		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 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	0.2768	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

