

IXYS

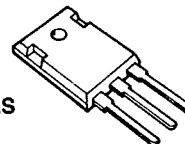
MAXIMUM RATINGS

Parameter	Sym.	IXTH24N45 IXTM24N45	IXTH24N50 IXTM24N50	Unit
Drain-Source Voltage (1)	V_{DSS}	450	500	V_{dc}
Drain-Gate Voltage ($R_{GS} = 1.0M\Omega$) (1)	V_{DGR}	450	500	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	24		A_{dc}
Drain Current Pulsed (3)	I_{DM}	96		A
Total Power Dissipation	P_D	300		W
Power Dissipation Derating $> 25^\circ C$		2.4		W/ $^\circ C$
Operating and Storage Temperature	T_J & T_{stg}	-65 to $+150$		$^\circ C$
Thermal Resistance	R_{thJC}	0.42		$^\circ C/W$
Max. Lead Temp. for Soldering	T_L	300 (1.6mm from case for 10 sec.)		$^\circ C$

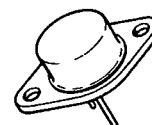
T-39-15
MegaMOS™ FETs
IXTH24N50, 45
IXTM24N50, 45

24 Amps, 450–500V, 0.23 Ω

IXTH SERIES
TO-247
(TO-3P)



IXTM SERIES
TO-204
(TO-3)

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	24N50	500	—	—	V	$V_{GS} = 0V$
	24N45	450	—	—	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	—	—	0.23	Ω	$V_{GS} = 10V$, $I_D = 0.5 I_D$ Max.
g_{FS} Forward Transconductance (2)	ALL	11.0	13.0	—	S	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$, $I_D = 0.5 I_D$ Max.
C_{iss} Input Capacitance	ALL	—	—	4500	pF	$V_{GS} = 0V$, $V_{DS} = 25V$, $f = 1.0$ MHz
C_{oss} Output Capacitance	ALL	—	—	550	pF	
C_{rss} Reverse Transfer Capacitance	ALL	—	—	160	pF	
$t_{d(on)}$ Turn-On Delay Time	ALL	—	—	100	ns	$V_{DD} = 0.5 BV_{DSS}$, $I_D = 0.5 I_D$ Max. $Z_O = 50\Omega$ (MOSFET switching times are essentially independent of operating temperature. See Fig. 7, page 56 for test circuit.)
t_r Rise Time	ALL	—	—	110	ns	
$t_{d(off)}$ Turn-Off Delay Time	ALL	—	—	220	ns	
t_f Fall Time	ALL	—	—	105	ns	
Q_g Total Gate Charge (Gate-Source Plus Gate-Drain)	ALL	—	165	—	nC	$V_{GS} = 10V$, $I_D = I_D$ Max., $V_{DS} = 0.8 BV_{DSS}$. (Gate charge is essentially independent of operating temperature. See Fig. 8, page 56 for test circuit.)
Q_{gs} Gate Source Charge	ALL	—	65	—	nC	
Q_{gd} Gate-Drain ("Miller") Charge	ALL	—	100	—	nC	

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

I_S	Continuous Source Current (Body Diode)	ALL	—	—	24	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier.	
I_{SM}	Pulse Source Current (Body Diode) (1)	ALL	—	—	96	A		
V_{SD}	Diode Forward Voltage (2)	ALL	—	—	1.5	V	$I_F = I_S, V_{GS} = 0V$	
t_{rr}	Reverse Recovery Time	ALL	—	500	—	ns	$V_R = 100V$	
Q_{rr}	Reverse Recovery Charge	ALL	—	8.0	—	uC	$T_j = 25^{\circ}C$	$I_F = I_S$ $dI_F/dt = 100A/\mu S$
			—	16	—		$T_j = 150^{\circ}C$	

(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.

IXTH24N50, 45
IXTM24N50, 45

T-39-15

IXYS

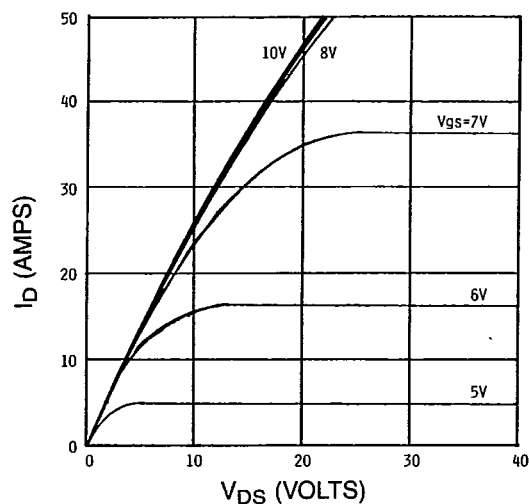


Figure 1. Output Characteristics

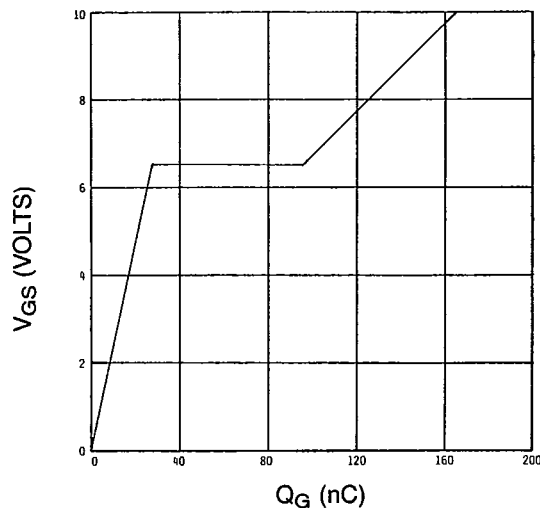
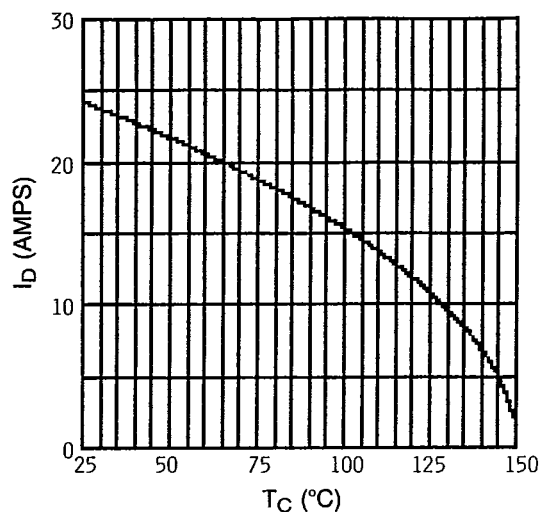
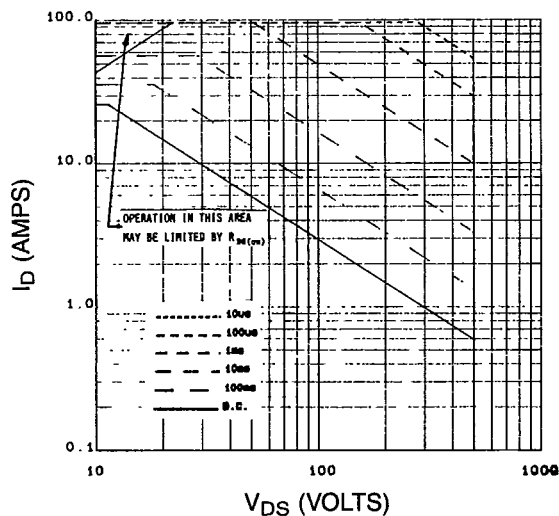
Figure 2. Gate Charge Vs V_{GS} Figure 3. I_D Vs Case Temperature

Figure 4. Safe Operating Area

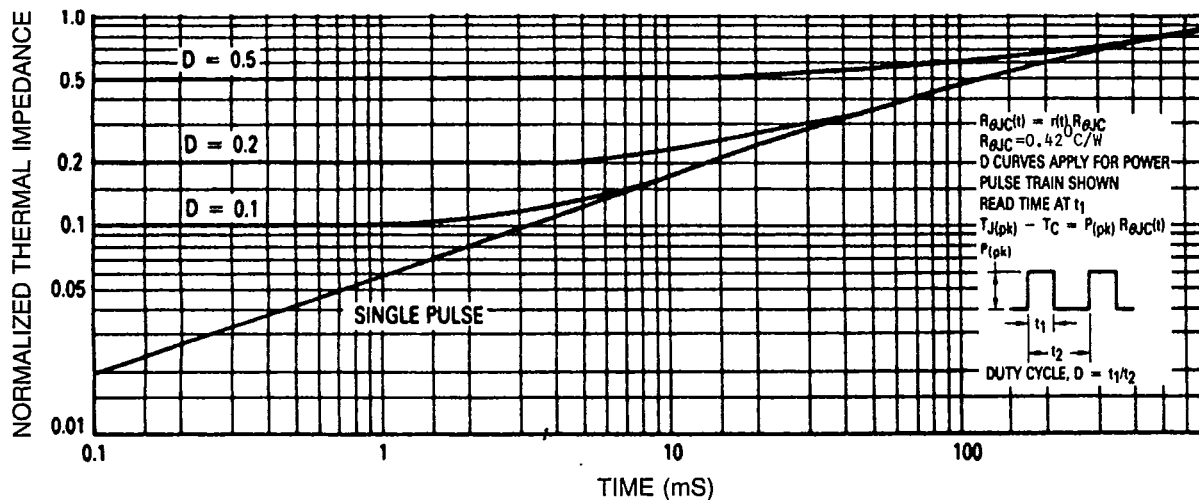
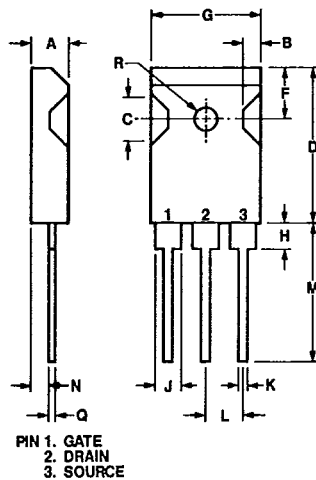


Figure 5. Transient Thermal Impedance

PACKAGE OUTLINES AND PINOUTS

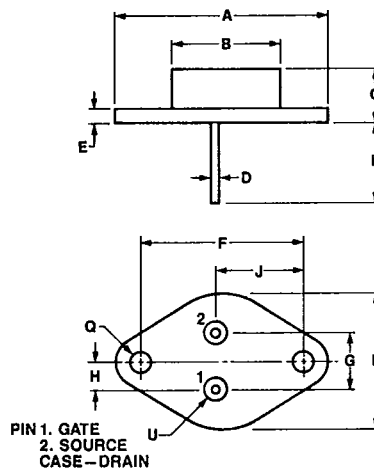
T-91-20

TO-247



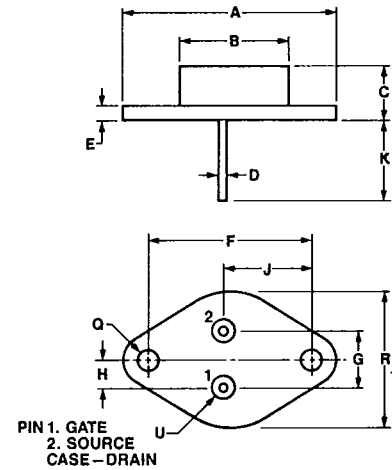
Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.8	5.2	.187	.203
B	1.7	2.7	.067	.106
C	3.1	3.9	.121	.152
D	20.8	21.2	.811	.827
F	5.8	6.2	.226	.242
G	15.7	15.9	.612	.620
H	—	4.5	—	.177
J	1.97	2.01	.077	.078
J ₁	2.97	3.01	.116	.119
K	1	1.4	.039	.055
L	5.25	5.65	.207	.222
M	19.8	20.2	.772	.778
N	2.2	2.4	.086	.094
Q	.4	.8	.016	.031
R	3.1	3.3	.121	.129

TO-204 AA



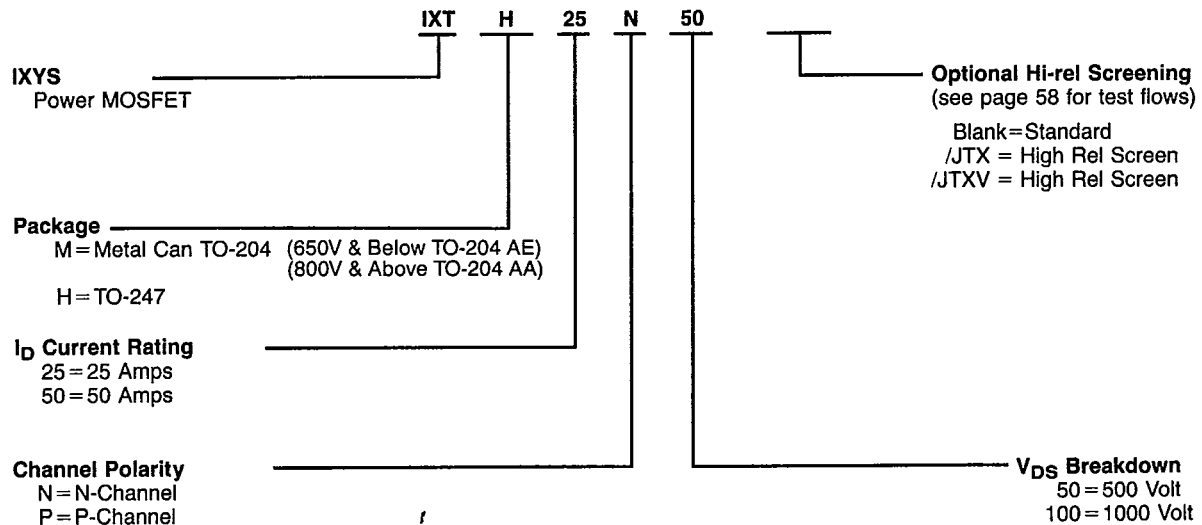
Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	—	39.37	—	1.55
B	—	19.71	—	.776
C	8.96	9.22	.353	.363
D	.097	1.09	.038	.043
E	2.66	2.92	.105	.115
F	30.15	BSC	1.187	BSC
G	10.74	11.05	.423	.435
H	5.46	BSC	.215	BSC
J	16.68	17.12	.657	.674
K	11.20	11.98	.441	.472
Q	3.86	4.11	.152	.162
R	24.84	25.27	.978	.995
U	4.19	5.56	.165	.203

TO-204 AE



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	—	39.37	—	1.55
B	—	19.71	—	.776
C	8.96	9.22	.353	.363
D	1.45	1.63	.58	.062
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
U	4.19	5.56	.165	.203

PART NUMBER DESCRIPTION

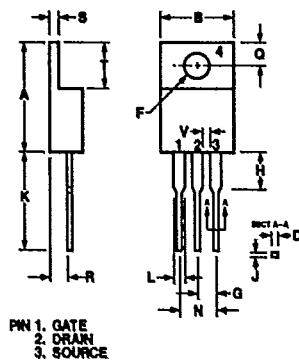


Note: Valid combinations are only those referenced in the IXYS price book or product selector guide. Consult your local IXYS sales office to confirm availability of specific combinations or new types.

DETAILED PACKAGE OUTLINES

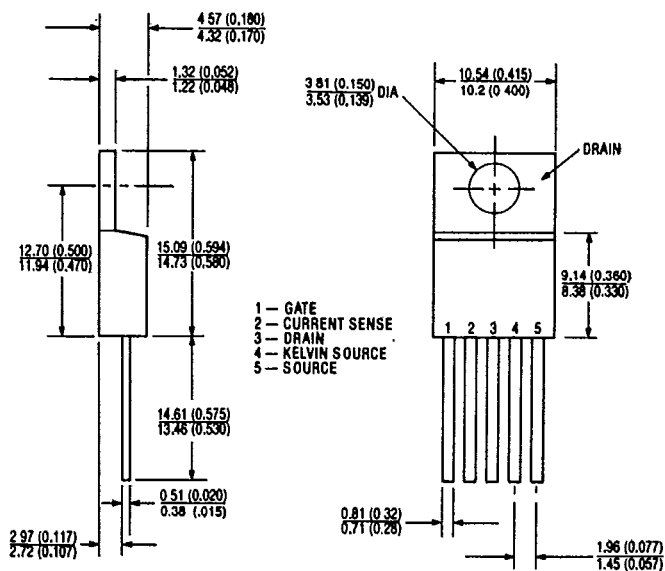
T-91-20

TO-220 AB

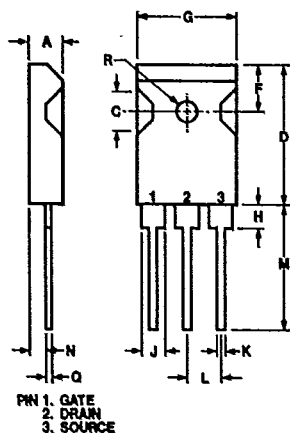


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	14.23	16.51	.560	.650
B	9.66	10.66	.380	.420
C	3.56	4.82	.140	.190
D	0.64	0.89	.025	.035
F	3.54	4.08	.139	.161
G	2.29	2.79	.090	.110
H	—	6.35	—	.250
J	0.51	.76	.020	.030
K	12.70	14.73	.500	.580
L	1.15	1.77	.045	.070
N	4.83	5.33	.190	.210
Q	2.54	3.42	.100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

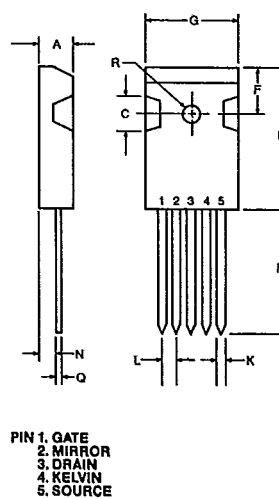


TO-247 (3 LEADED)



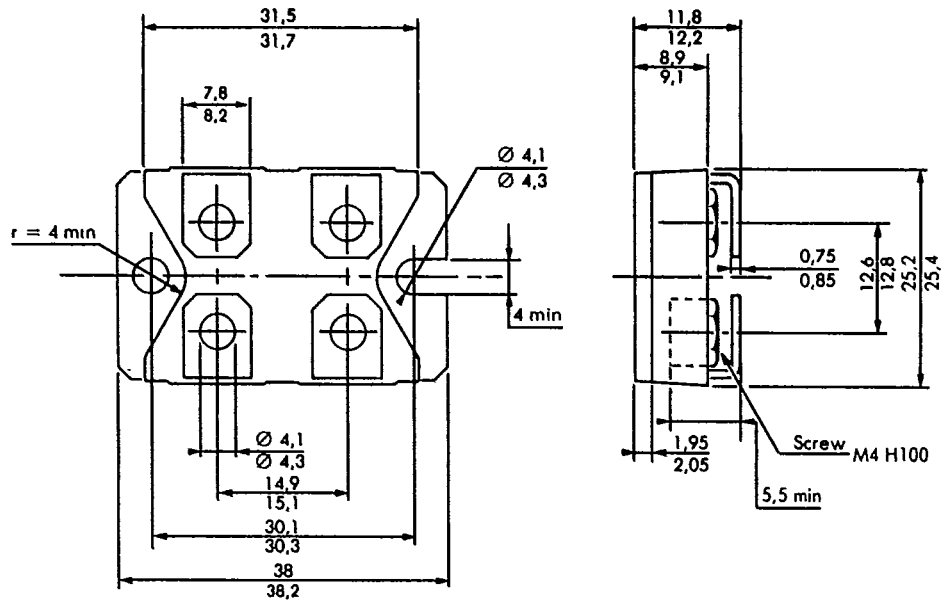
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
H	3.7	4.3	.146	.169
J	1.95	2.4	.077	.094
J ₁	2.97	3.4	.117	.134
K	1.0	1.4	.040	.055
L	5.4	5.5	.213	.217
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4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

TO-247 (5 LEADED)

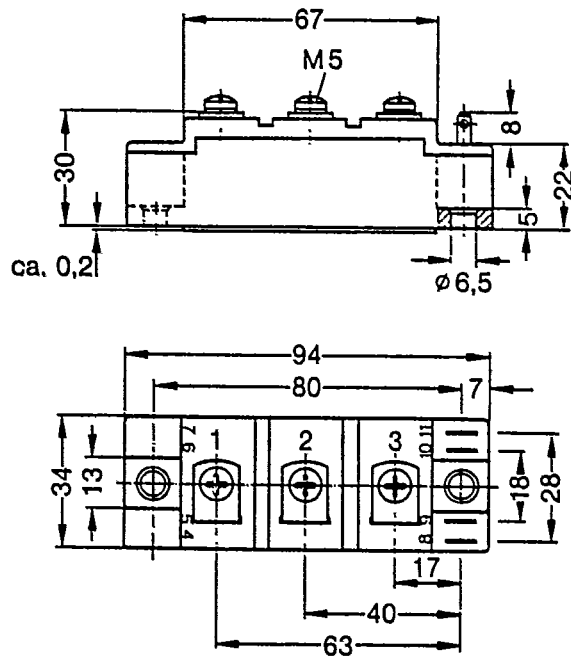


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
K	1.1	1.3	.043	.051
L	2.51	2.56	.099	.101
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4	0.8	.016	.031
R	2.9	3.3	.114	.129

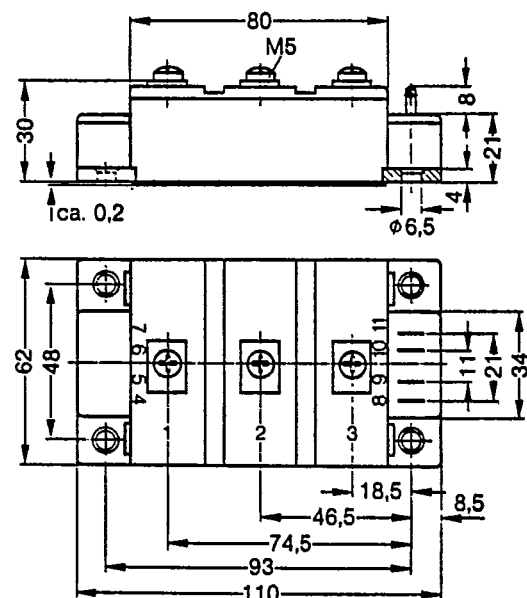
TO-238
Dimensions in Millimeters



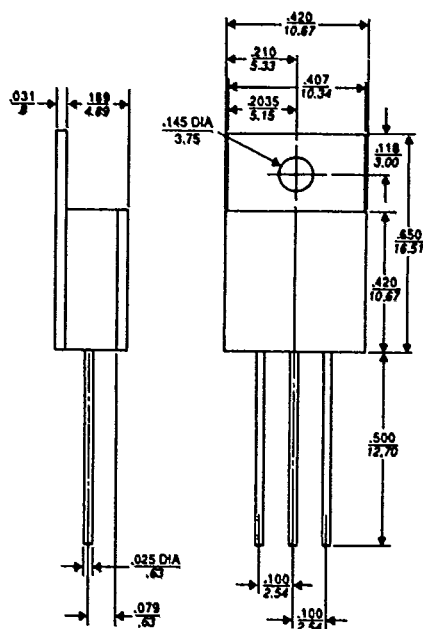
Y-4
Dimensions in Millimeters



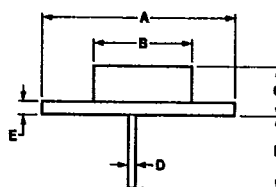
Y-3
Dimensions in Millimeters



TO-220 HERMETIC



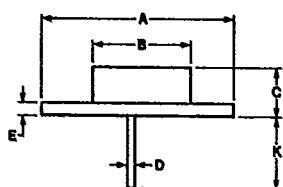
TO-204 AE



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

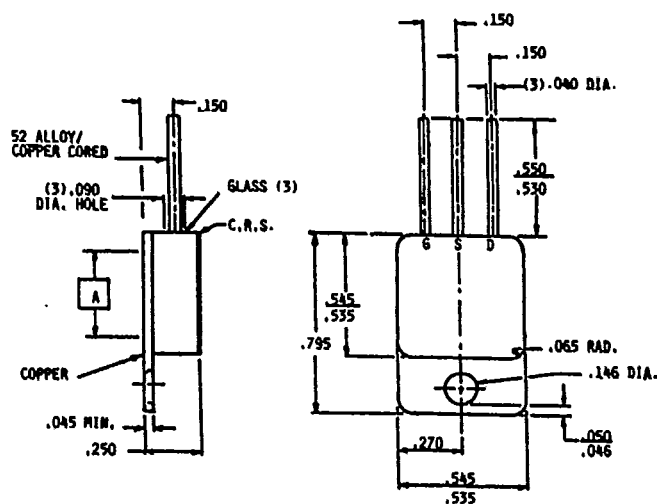
TO-204 AA



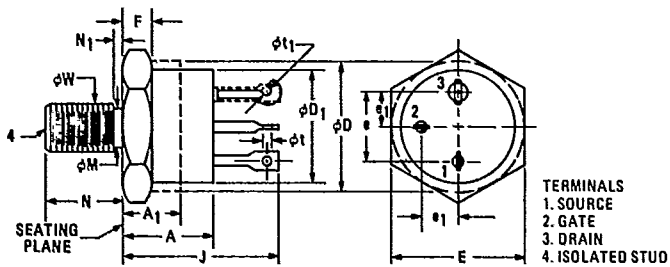
PIN 1. GATE
2. SOURCE
CASE - DRAIN

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)

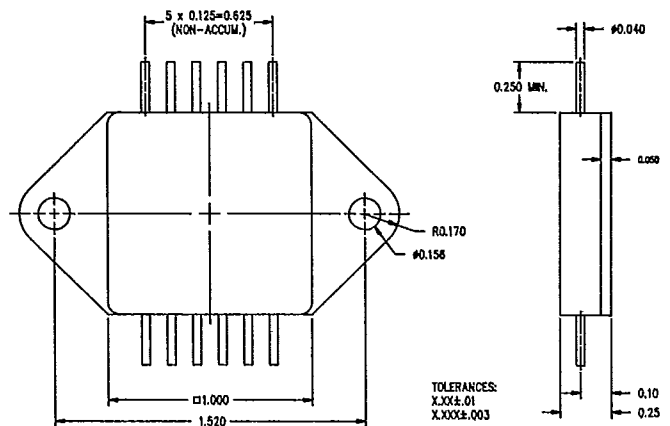


Symbol	Inches		Millimeters		Notes	Symbol	Inches		Millimeters		Notes
	Min.	Max.	Min.	Max.			Min.	Max.	Min.	Max.	
A	0.325	0.450	8.26	11.68		J	0.640	0.875	16.26	22.23	
A ₁		0.270		6.86	2	ϕM	0.220	0.249	5.59	6.32	
ϕD	0.610	0.687	15.49	17.45	2	N	0.422	0.455	10.72	11.56	
ϕD ₁	0.570	0.610	14.48	15.49		N ₁		0.090		2.29	
E	0.667	0.687	16.94	17.45		ϕt	0.055	0.072	1.19	1.83	
e	0.340	0.415	8.64	10.54	5	ϕt ₁	0.046	0.077	1.17	1.96	4
e ₁	0.170	0.213	4.32	5.41	5	ϕW	0.2225	0.2268	5.661	5.761	3
F	0.090	0.150	2.29	3.81	1						

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 (SCREW THREAD STANDARDS FOR FEDERAL SERVICES - HANDBOOK H 28).
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

