IXYS

ADVANCED TECHNICAL DATA SHEET* DATA SHEET NO. 41014A

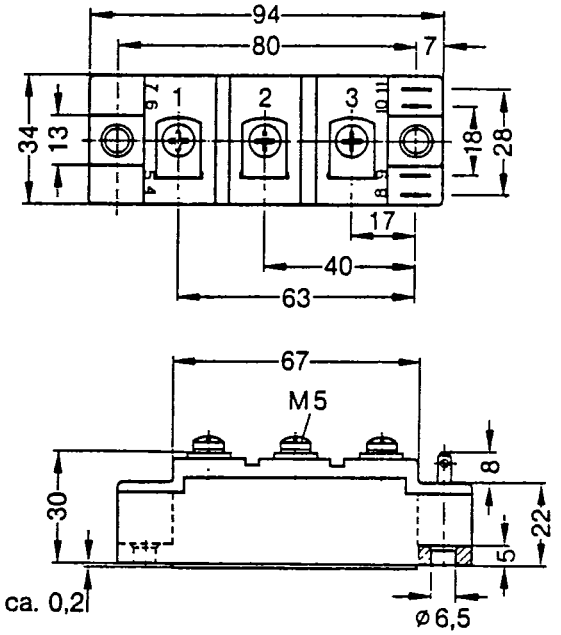
MOSBLOC™ IGBT MODULE

IXGQ50N90Y4

MAXIMUM RATINGS (T_C = 25 °C unless otherwise indicated)

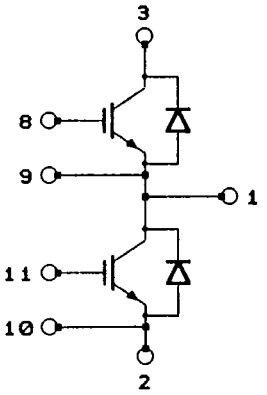
Rating	Conditions	Symbol	Value	Unit
Collector-Emitter Voltage		V_{CES}	900	V
Gate-Emitter Voltage (Continuous)		V_{GES}	±20	V
Collector Current (IGBT)	DC, T_C = 25 °C	I_C	50	A
	DC, T_C = 85 °C	I_C	35	A
Collector Surge Current (IGBT)	1 mSec	I_{CM}	100	A
Diode Forward Current	DC	I_F	50	A
Diode Surge Current	1 mSec	I_{FM}	100	A
Maximum Junction Temperature		T_J	150	°C
Storage Temperature		T_{stg}	-40 to +125	°C
Thermal Resistance (IGBT)		R_{thJC}	0.5	K/W
Collector Power Dissipation		P_C	250	W
Derating (IGBT)			2.0	W/°C
Thermal Resistance (Diode)		R_{thJC}	0.9	K/W
Isolation Voltage	AC for 1 min.	V_{ISOL}	2500	V
Screw Torque (Mounting) (Terminals)		M_M M_T	22 33	in-lb in-lb

OUTLINE DRAWING

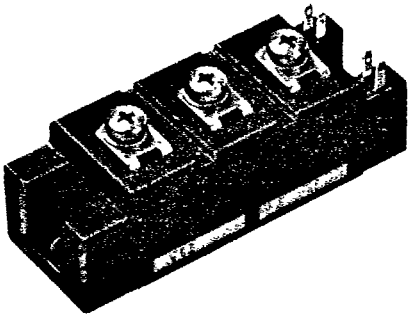


NOTE: DIMENSIONS IN mm (1 mm = 0.0394")

CIRCUIT DIAGRAM



Y4 PACKAGE
(94mm X 34mm)



IXYS Corporation
2355 Zanker Rd., San Jose, CA 95131-1109
TEL: (408) 435-1900 • TLX: 384928 IXYS SNJ UD • FAX: (408) 435-0670

ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise specified)

CHARACTERISTIC	TEST CONDITION		SYMBOL	MIN	TYP	MAX	UNIT
Collector-Emitter Breakdown Voltage (1)	V_{GE} = 0 V; I_C = 1 mA		$V_{(BR)CES}$	900			V
Collector Cut-off Current	V_{CE} = 900 V; V_{GE} = 0 V; T_J = 25 °C		I_{CES}			1.0	mA
	V_{CE} = 720 V; V_{GE} = 0 V; T_J = 125 °C		I_{CES}			15	mA
Gate Threshold Voltage	I_C = 0.25 mA; V_{CE} = V_{GE}		$V_{GE\ (th)}$	2.5		5.0	V
Gate-Emitter Leakage Current (4)	V_{GE} = ± 20 V; V_{CE} = 0		I_{GES}			500	nA
Collector-Emitter Saturation Voltage	I_C = 50 A, V_{GE} = 15 V	T_C = 25 °C	$V_{CE\ (sat)}$		3.5	4.5	V
		T_C = 125 °C	$V_{CE\ (sat)}$		4.0	5.0	V
Input Capacitance	V_{CE} = 10 V, V_{GE} = 0 V, f = 1.0 MHz		C_{ies}		4.5		nF
Reverse Transfer Capacitance			C_{res}		100		pF
Fall Time	LOAD = INDUCTIVE, I_C = 50 A, V_{CC} = 600 V, R_G = 100 Ω	T_J = 25 °C	t_f		200		nS
Rise Time			t_r		200		nS
Turn-off Delay			$t_{d(off)}$		1000		nS
Turn-off Energy		T_J = 125 °C	E_{off}		5.5		mJ

DIODE CHARACTERISTICS

CHARACTERISTIC	TEST CONDITION		SYMBOL	MIN	TYP	MAX	UNIT
Repetitive Reverse Voltage (3)			V_{RRM}			900	V
Forward Voltage (2)	I_F = 50 A; V_{GE} = 0 V		V_F			3.0	V
Reverse Recovery Time	I_F = 50 A, di/dt = 100 A/µS, V_{GE} = -10 V, V_{RR} = 350 V	T_J = 25 °C	t_{rr}		60		nS
		T_J = 125 °C	t_{rr}		100		nS
Reverse Recovery Charge		T_J = 25 °C	q_{rr}		150		nC
		T_J = 125 °C	q_{rr}		450		nC

NOTES:
1. T_J = 25 °C to 150 °C
2. Pulse test: Pulse width ≤ 300µS, duty cycle ≤ 2%
3. Repetitive rating: Pulse width limited by maximum junction temperature.
4. Gate-Emitter Voltage Transient (V_{GE}) = ± 30 V.

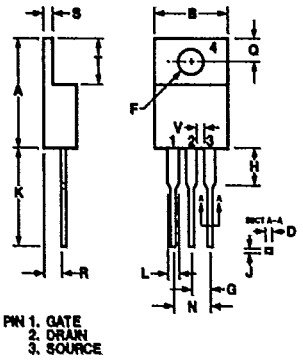
*The data supplied herein reflects the Design Technical Objective Specification. The subject products are in Product Development. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

IXYS Corporation
2355 Zanker Rd., San Jose, CA 95131-1109
TEL: (408) 435-1900 • TLX: 384928 IXYS SNJ UD • FAX: (408) 435-0670

DETAILED PACKAGE OUTLINES

T-91-20

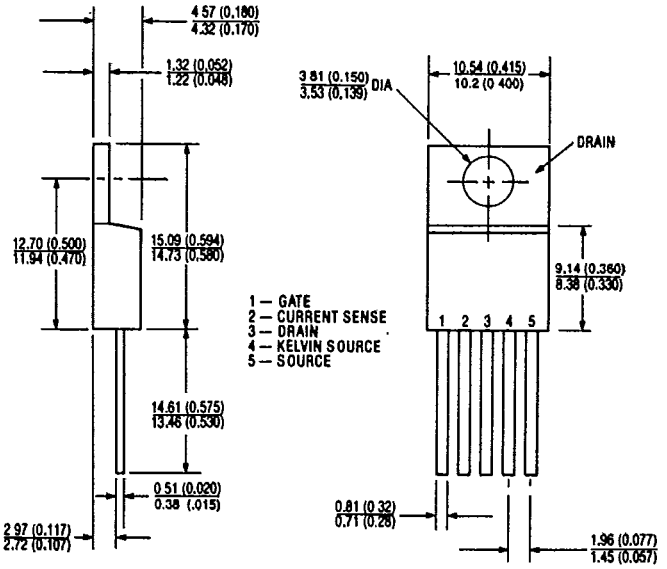
TO-220 AB



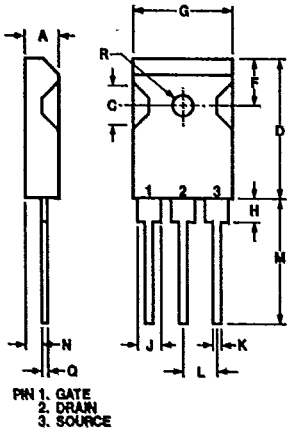
Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	14.23	16.51	.560	.650
B	9.66	10.66	.380	.420
C	3.56	4.82	.140	.190
D	0.64	0.89	.025	.035
F	3.54	4.08	.139	.161
G	2.29	2.79	.090	.110
H	–	6.35	–	250
J	0.51	.76	.020	030
K	12.70	14.73	.500	.580
L	1.15	1.77	045	.070
N	4.83	5.33	.190	.210
Q	2.54	3.42	.100	135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

CONFORMS TO OUTLINE TO-220 (IR H-7)

Dimensions in Millimeters (Inches)

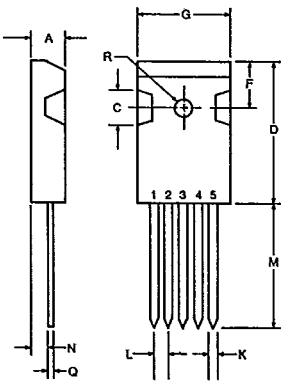


TO-247 (3 LEADED)



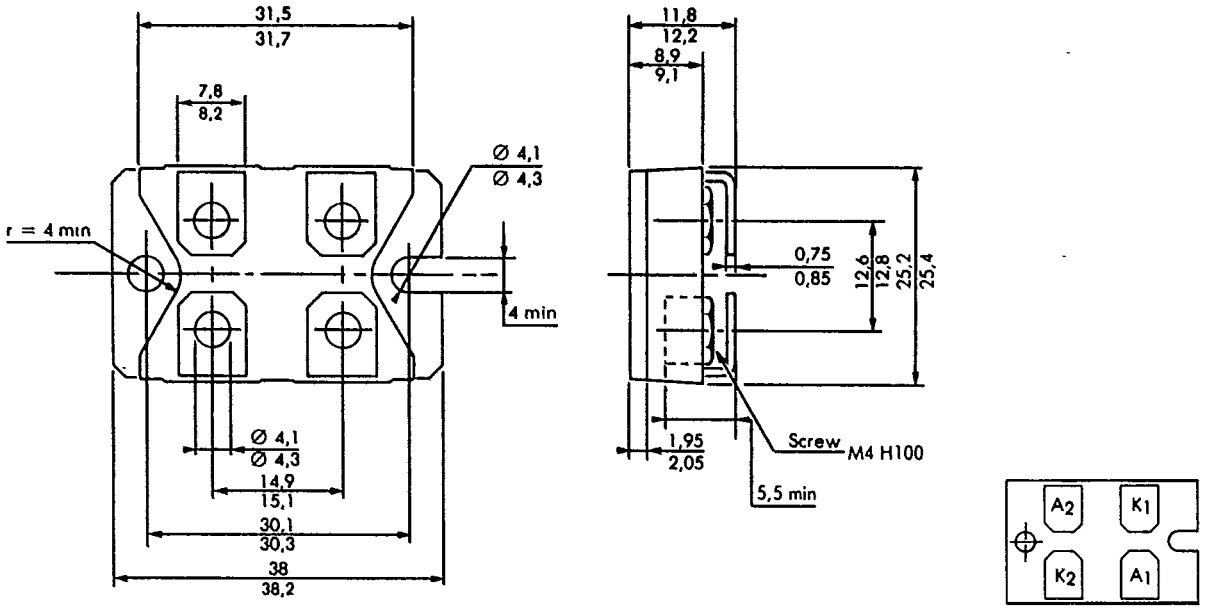
Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
H	3.7	4.3	.146	.169
J	1.95	2.4	.077	.094
J_1	2.97	3.4	.117	.134
K	1.0	1.4	.040	.055
L	5.4	5.5	.213	.217
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4	0.8	.016	.031
R	2.9	3.3	.114	.129

TO-247 (5 LEADED)

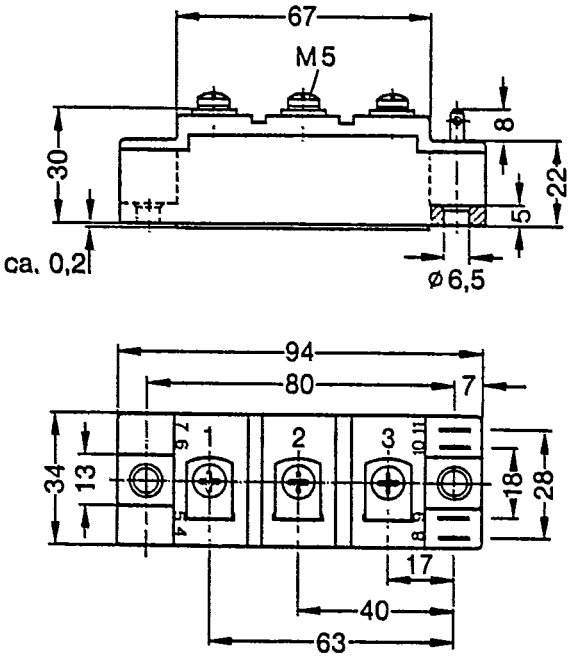


Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
K	1.1	1.3	.043	.051
L	2.51	2.56	.099	.101
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4	0.8	.016	.031
R	2.9	3.3	.114	.129

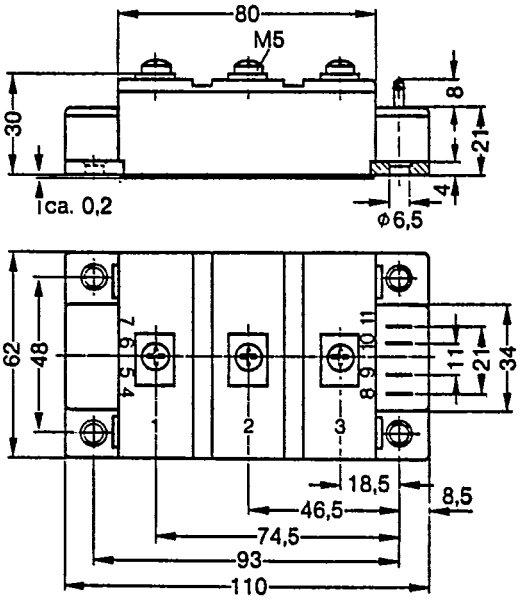
TO-238
Dimensions in Millimeters



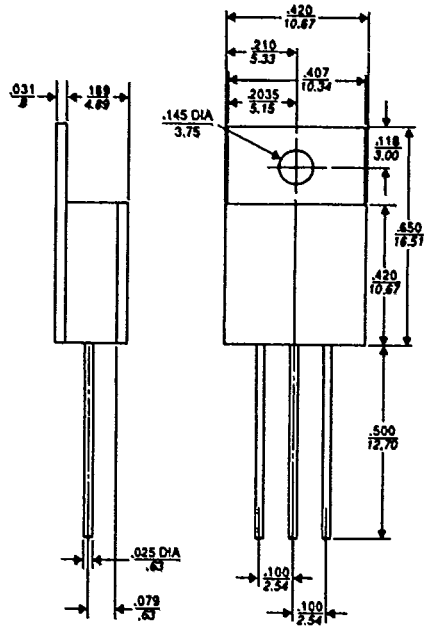
Y-4
Dimensions in Millimeters



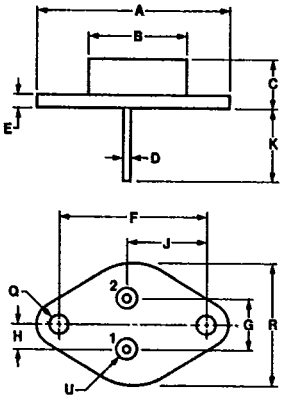
Y-3
Dimensions in Millimeters



TO-220 HERMETIC



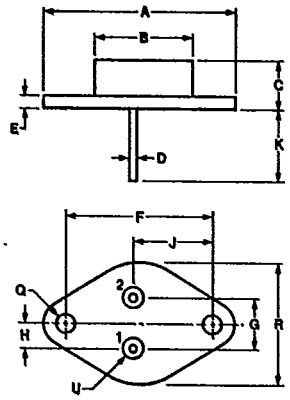
TO-204 AE



PIN 1. GATE
2. SOURCE
CASE–DRAIN

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	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

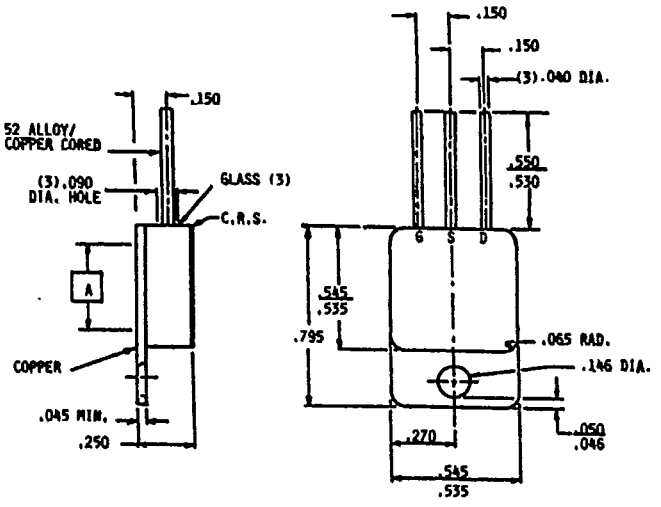
TO-204 AA



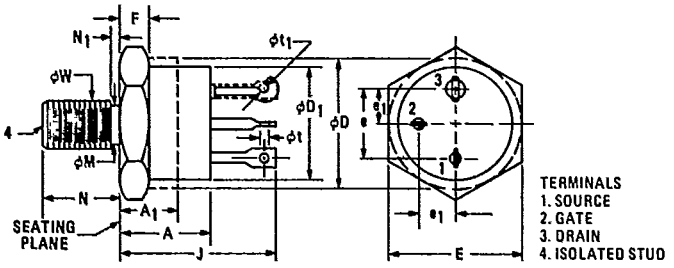
PIN 1. GATE
2. SOURCE
CASE–DRAIN

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	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)

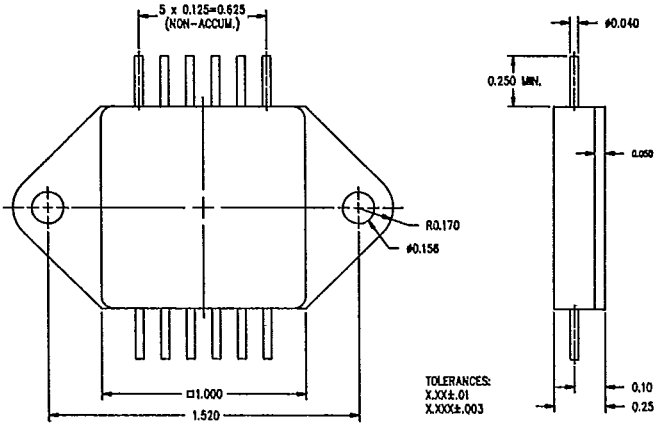


Symbol	Inches Min.	Inches Max.	Millimeters Min.	Millimeters Max.	Notes
A	0.325	0.460	8.26	11.68	
A_1		0.270		6.86	2
øD	0.610	0.687	15.49	17.45	2
$øD_1$	0.570	0.610	14.48	15.49	
E	0.667	0.687	16.94	17.45	
e	0.340	0.415	8.64	10.54	5
e_1	0.170	0.213	4.32	5.41	5
F	0.090	0.150	2.29	3.81	1

Symbol	Inches Min.	Inches Max.	Millimeters Min.	Millimeters Max.	Notes
J	0.640	0.875	16.26	22.23	
øM	0.220	0.249	5.59	6.32	
N	0.422	0.455	10.72	11.56	
N_1		0.090		2.29	
øt	0.055	0.072	1.19	1.83	
$øt_1$	0.046	0.077	1.17	1.96	4
øW	0.2225	0.2268	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 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