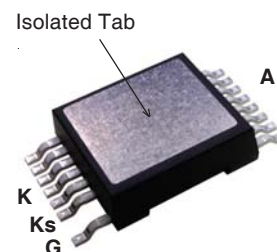
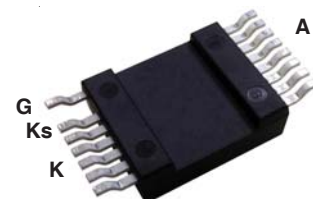
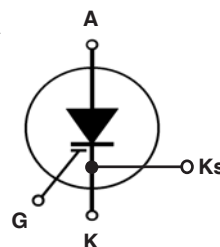


1500V MOS Gated Thyristor

MMJX1H40N150

$V_{DM} = 1500V$

(Electrically Isolated Tab)



Symbol	Test Conditions	Maximum Ratings	
V_{DM}	$T_J = 25^{\circ}C$ to $150^{\circ}C$	1500	V
V_{GK}	Continuous	± 30	V
V_{GK}	Transient	± 40	V
I_{TSM}	$T_C = 25^{\circ}C$, $1\mu s$	15.5	kA
	$T_C = 25^{\circ}C$, $10\mu s$	6.4	kA
P_D	$T_C = 25^{\circ}C$	320	W
T_J		-55 ... +150	$^{\circ}C$
T_{JM}		150	$^{\circ}C$
T_{stg}		-55 ... +150	$^{\circ}C$
T_L	Maximum Lead Temperature for Soldering	300	$^{\circ}C$
T_{SOLD}	1.6 mm (0.062 in.) from Case for 10s	260	$^{\circ}C$
V_{ISOL}	50/60Hz, 1 minute	2500	V~
F_C	Mounting Force	50..200/11..45	N/lb
Weight		5	g

G = Gate K = Cathode
A = Anode Ks = Cathode Sense

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 2500V~ Electrical Isolation
- Very High Current Capability

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

- Capacitive Discharge Circuits
- Ignition Circuits
- Solid State Surge Protection

Symbol	Test Conditions ($T_J = 25^{\circ}C$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
V_{BR}	$I_A = 250\mu A$, $V_{GK} = 0V$	1500		V
$V_{GK(th)}$	$I_A = 250\mu A$, $V_{AK} = V_{GK}$	2.5		5.0 V
V_T	$I_T = 1000A$, $V_{GK} = 15V$		4.75	6.0 V
r_T	$I_T > I_L$, $V_{GK} = 15V$		1.20	m Ω
V_{BO}	$V_{GK} = 15V$		5.25	V
I_D	$V_{AK} = 1500V$, $V_{GK} = 0V$ $T_J = 125^{\circ}C$			15 μA 1.5 mA
I_L			250	A
I_H			200	A
I_{GKS}	$V_{AK} = 0V$, $V_{GK} = \pm 30V$			± 200 nA

Symbol Test Conditions $(T_J = 25^\circ\text{C}$ Unless Otherwise Specified)**Characteristic Values****Min. Typ. Max.**

C_{iks}	} $V_{AK} = 25V, V_{GK} = 0V, f = 1\text{MHz}$	2825	pF
C_{oks}		164	pF
C_{rks}		50	pF
$Q_{g(on)}$	} $I_C = 40A, V_{GK} = 15V, V_{AK} = 600V$	99	nC
Q_{gk}		22	nC
Q_{ga}		36	nC
t_{ri}	} Capacitive Discharge, $T_J = 25^\circ\text{C}$ $I_A = 2000A, V_{GK} = 15V, R_G = 1\Omega$	100	ns
t_d		50	ns
t_{ri}	} Capacitive Discharge, $T_J = 125^\circ\text{C}$ $I_A = 2000A, V_{GK} = 15V, R_G = 1\Omega$	100	ns
t_d		50	ns
R_{thJC}			0.39 $^\circ\text{C/W}$
R_{thCS}		0.12	$^\circ\text{C/W}$
R_{thJA}		30	$^\circ\text{C/W}$

Notes:

1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.
2. It is recommended to use a gate driver capable of supplying more than 4Amps and $\geq 15V$ gate voltage.
3. Refer to fig. 8 & 9.

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
4,860,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	

Fig. 1. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

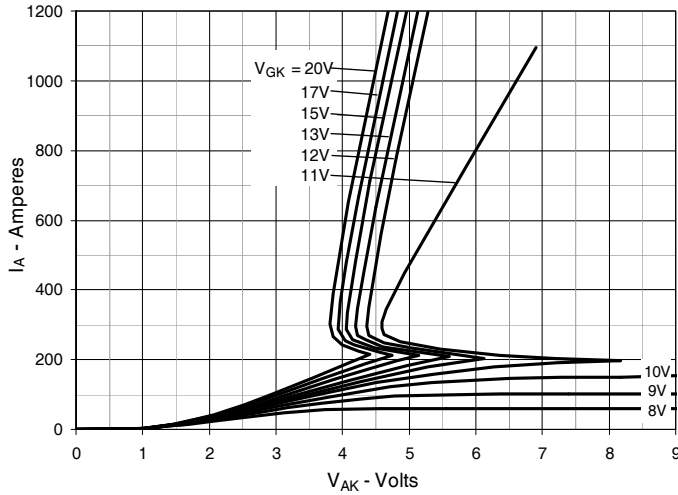


Fig. 2. Extended Output Characteristics @ $T_J = 125^\circ\text{C}$

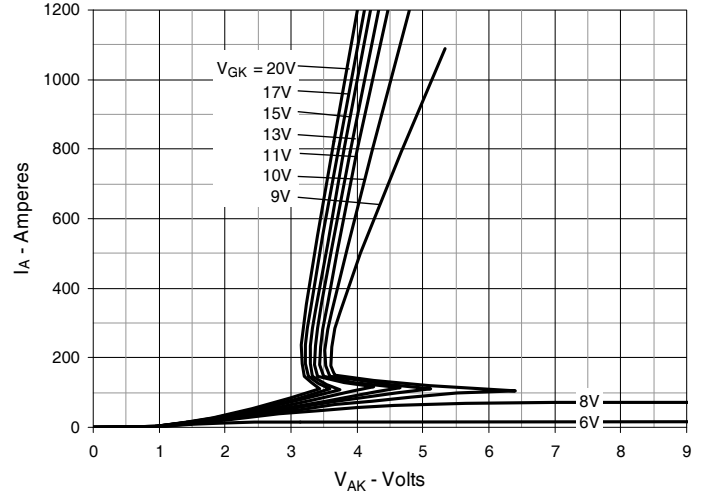


Fig. 3. Extended Output Characteristics @ $T_J = -40^\circ\text{C}$

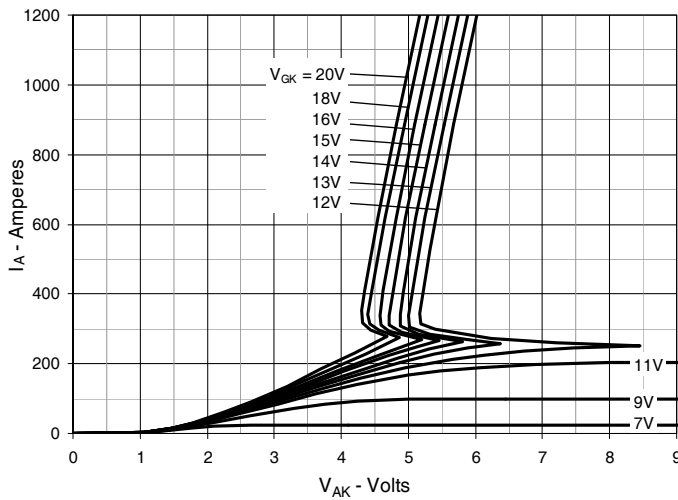


Fig. 4. Gate Charge

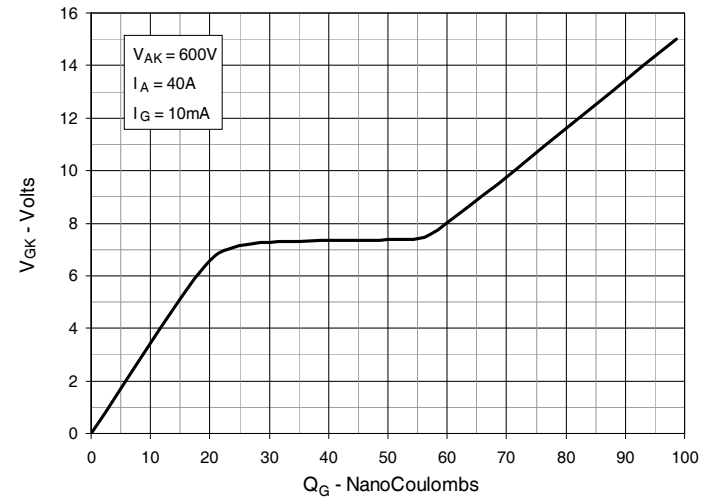


Fig. 5. Capacitance

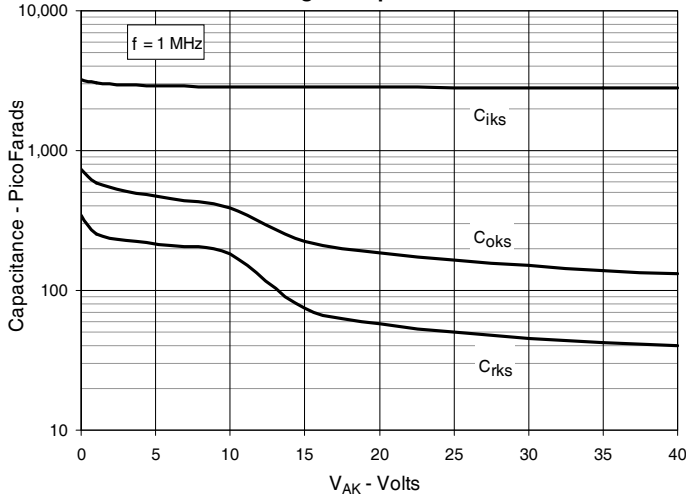
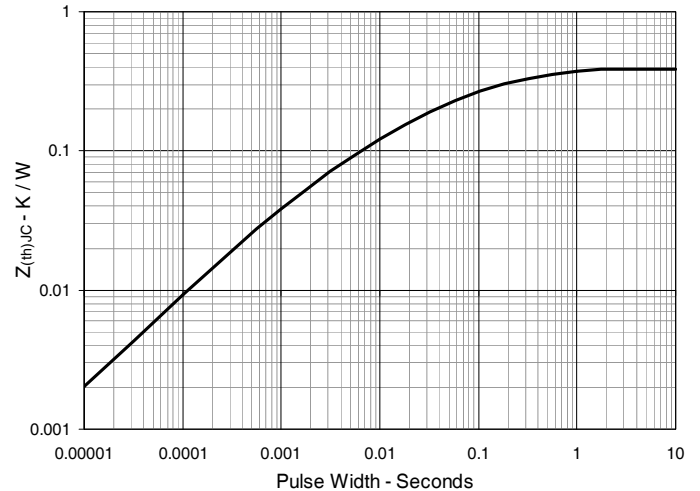


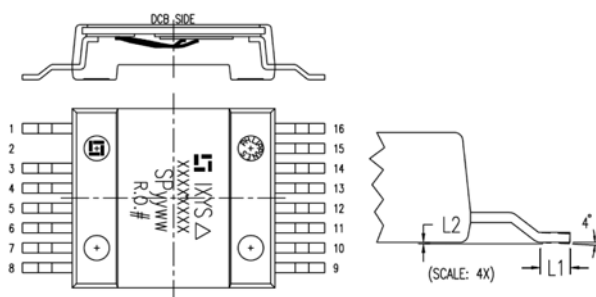
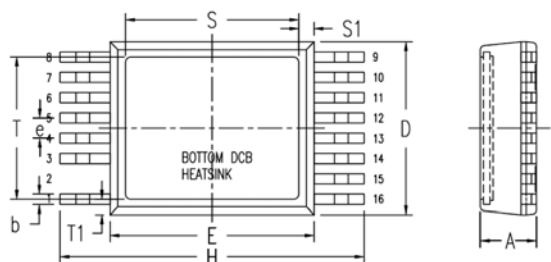
Fig. 6. Maximum Transient Thermal Impedance



The diagram shows a ladder network. On the left, a voltage source is connected in series with a resistor R_1 . This is followed by a shunt capacitor C_1 . Then, a series resistor R_2 is connected, followed by a shunt capacitor C_2 . This pattern continues with a series resistor R_3 and a shunt capacitor C_3 . The network is terminated by an output impedance i , indicated by three dots on both the top and bottom lines.

i	Ri (Ω)	Ci (F)
1	0.014083	0.0078555
2	0.068078	0.0196550
3	0.133430	0.1199600
4	0.121939	2.5000000

The graph shows the turn-off characteristics of a thyristor. The vertical axis represents both anode-cathode voltage (V_{AK}) and anode current (I_A). The horizontal axis represents Time. The V_{AK} curve starts at a constant high level, then drops sharply to zero. The I_A curve starts at a constant high level, then drops sharply to zero. The turn-off delay time t_{rl} is the time interval between the 10% and 90% points of the I_A curve's fall. A vertical dashed line marks the 90% point of I_A and the 10% point of V_{AK} .



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.209	.224	5.30	5.70
A1	.154	.161	3.90	4.10
A2	.055	.063	1.40	1.60
b	.035	.045	0.90	1.15
c	.018	.026	0.45	0.65
D	.661	.677	16.80	17.20
E	.780	.795	19.80	20.20
E1	.425	.441	10.80	11.20
e	.079 BSC		2.00 BSC	
H	1.161	1.185	29.50	30.10
L	.181	.209	4.60	5.30
L1	.051	.067	1.30	1.70
L2	.000	.006	0.00	0.15
S	.661	.677	16.80	17.20
S1	.051	.067	1.30	1.70
T	.543	.559	13.80	14.20
T1	.051	.067	1.30	1.70

NOTE:

1. ALL LEADS ARE MATTE PURE TIN PLATED.
2. CU SURFACE OF BOTTOM DCB IS PRE-NI PLATED UNLESS OTHERWISE.
3. CU SURFACE OF BOTTOM DCB IS ELECTRICALLY ISOLATED 2,500V AC FROM ALL OTHER LEADS.
4. UNLESS OTHER SPECIFIED, PIN OUT ARE AS FOLLOWS.

PINS:

- 1 - GATE
- 3 - Ks = Cathode Sense
- 4 - 8 - K = Cathode
- 9 - 16 - A = Anode



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