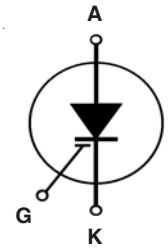
IXYS

Preliminary Technical Information

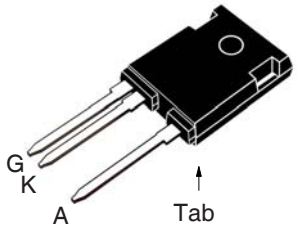
1500V MOS Gated Thyristor

IXHH40N150HV

V_{DM} = 1500V



TO-247HV



G = Gate K = Cathode
A = Anode Tab = Anode

Symbol	Test Conditions	Maximum Ratings	
V_{DM}	T_J = 25°C to 150°C	1500	V
V_{GK}	Continuous	±30	V
V_{GK}	Transient	±40	V
I_{TSM}	T_C = 25°C, 1µs	7.6	kA
	T_C = 25°C, 10µs	3.5	kA
P_D	T_C = 25°C	695	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062 in.) from Case for 10s	260	°C
M_d	Mounting Torque	1.13/10	Nm/lb.in
Weight		6	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
V_{BR}	I_A = 250µA, V_{GK} = 0V	1500			V
$V_{GK(th)}$	I_A = 250µA, V_{AK} = V_{GK}	2.5		5.0	V
V_T	I_T = 1000A, V_{GK} = 15V		5.95	7.5	V
r_T	I_T > I_L, V_{GK} = 15V		1.20		mΩ
V_{BO}	V_{GK} = 15V		6.45		V
I_D	V_{AK} = 1500V, V_{GK} = 0V			15	µA
	T_J = 125°C			1	mA
I_L			250		A
I_H			200		A
I_{GKS}	V_{AK} = 0V, V_{GK} = ±30V			±200	nA

Features

- Very High Voltage Package
- Very High Current Capability

Advantages

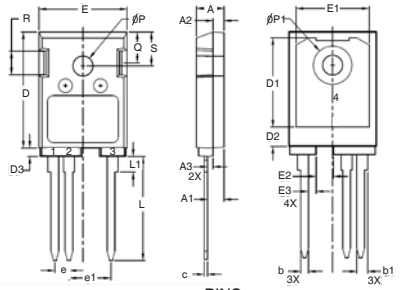
- High Power Density
- Low Gate Drive Requirement

Applications

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

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
C_{iks}	V_{AK} = 25V, V_{GK} = 0V, f = 1MHz		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°C**		100	ns
t_d	I_A = 2000A, V_{GK} = 15V, R_G = 1Ω V_{AK} = 1000V, L < 20nH, Notes 2 & 3		50	ns
t_{ri}	**Capacitive Discharge, T_J = 125°C**		100	ns
t_d	I_A = 2000A, V_{GK} = 15V, R_G = 1Ω V_{AK} = 1000V, L < 20nH, Notes 2 & 3		50	ns
R_{thJC}				0.18 °C/W
R_{thCS}			0.21	°C/W

TO-247HV Outline



PINS:
1 - Gate 2 - Cathode
3, 4 - Anode

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.193	.201	4.90	5.10
A1	.114	.122	2.90	3.10
A2	.075	.083	1.90	2.10
A3	.035	.043	0.90	1.10
b	.053	.059	1.35	1.50
b1	.075	.083	1.90	2.10
c	.022	.030	0.55	0.75
D	.819	.843	20.80	21.40
D1	.638	.646	16.20	16.40
D2	.134	.146	3.40	3.70
D3	.055	.063	1.40	1.60
E	.622	.638	15.80	16.20
E1	.520	.528	13.20	13.40
E2	.118	.126	3.00	3.20
E3	.051	.059	1.30	1.50
e	.100 BSC		2.54 BSC	
e1	.300 BSC		7.62 BSC	
L	.732	.748	18.60	19.00
L1	.106	.118	2.70	3.00
øP	.138	.142	3.50	3.60
øP1	.272	.280	6.90	7.10
Q	.216	.224	5.50	5.70
R	.165	.169	4.20	4.30
S	.240	.248	6.10	6.30

Notes:

1. Pulse test, t ≤ 300µs, duty cycle, d ≤ 2%.
2. It is recommended to use a gate driver capable of supplying more than 4Amps and ≥15V gate voltage.
3. Refer to fig. 8 & 9.

PRELIMANARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

Fig. 1. Extended Output Characteristics @ T_J = 25ºC

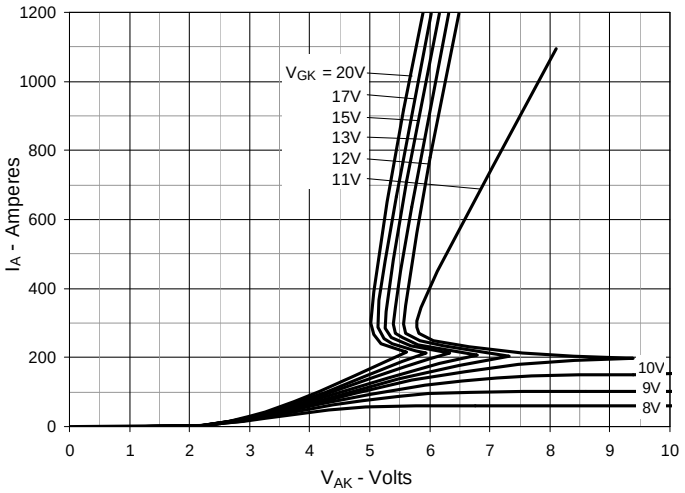


Fig. 2. Extended Output Characteristics @ T_J = 125ºC

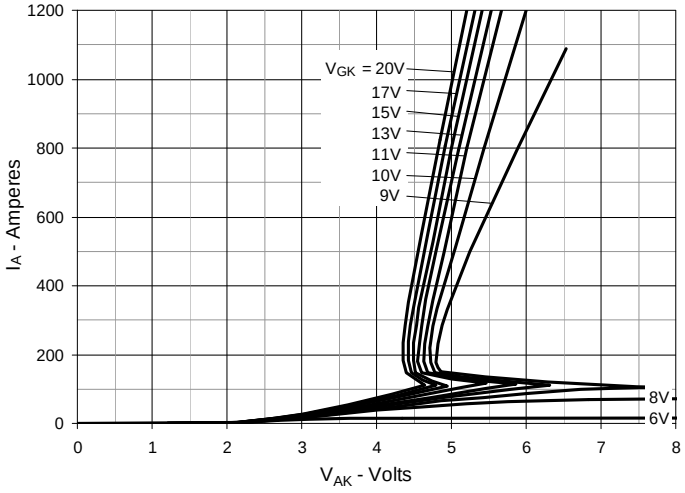


Fig. 3. Extended Output Characteristics @ T_J = - 40ºC

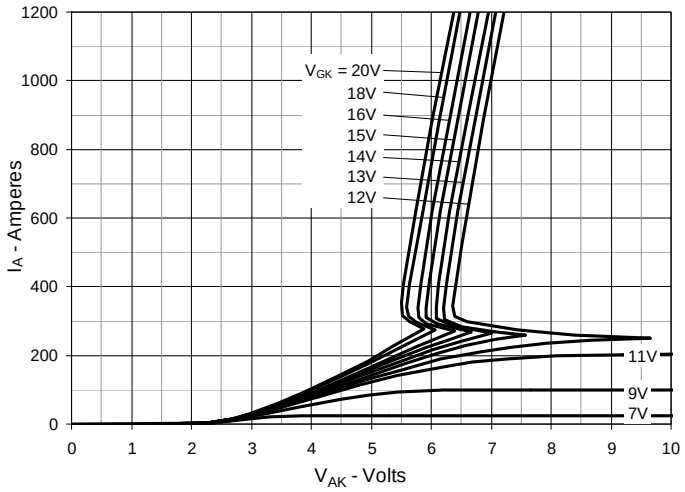


Fig. 4. Gate Charge

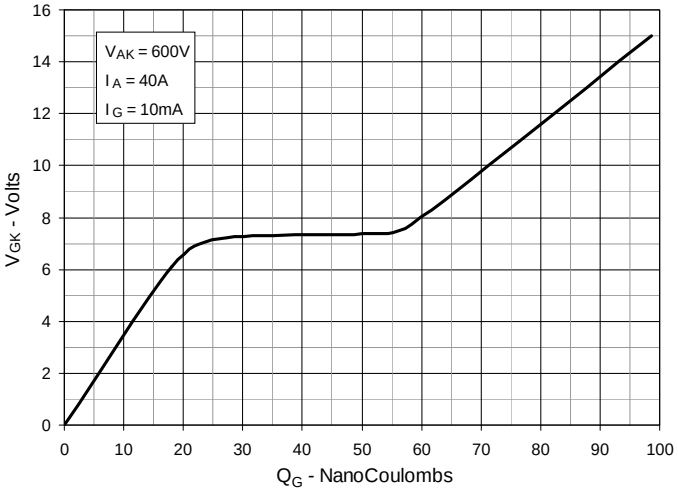


Fig. 5. Capacitance

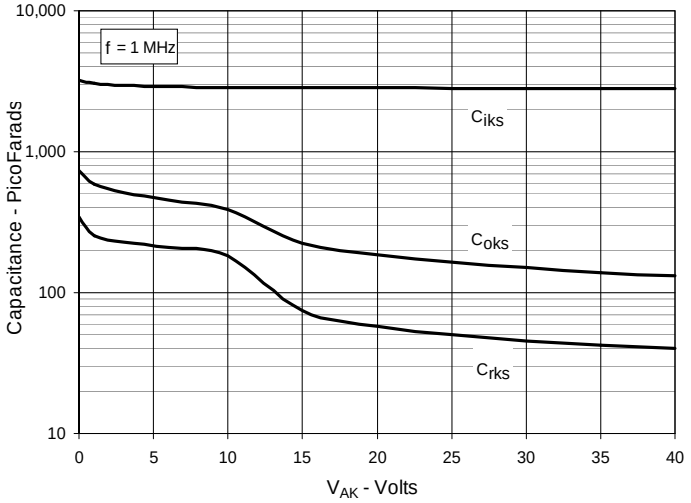


Fig. 6. Maximum Transient Thermal Impedance

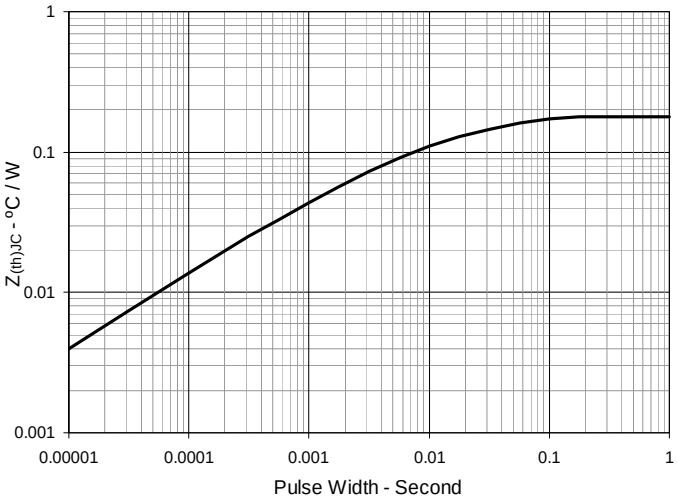
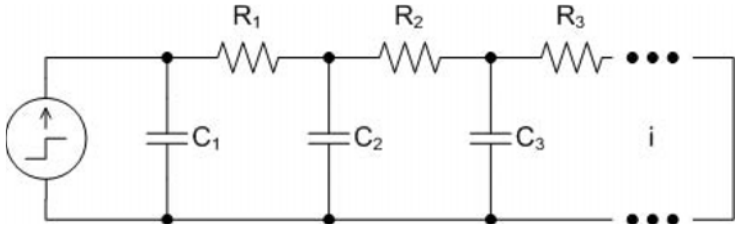


Fig. 7. Cauer Thermal Network



i	Ri (Ω)	Ci (F)
1	0.015004	0.005397
2	0.071079	0.028026
3	0.051007	0.121930
4	0.002310	2.500000

Fig. 8. Capacitive Discharge

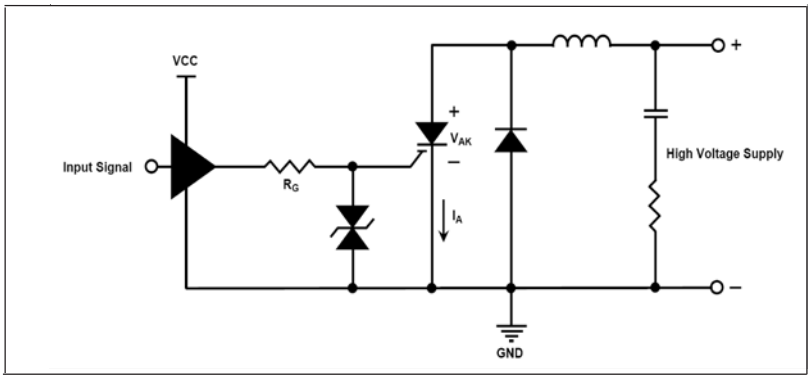


Fig. 9. Capacitive Discharge Waveform