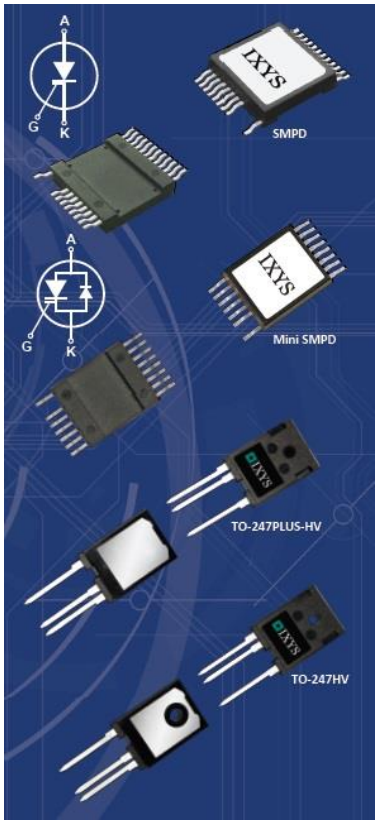
1500V MOS-Gated Thyristors

IXYS Corporation
June 2014

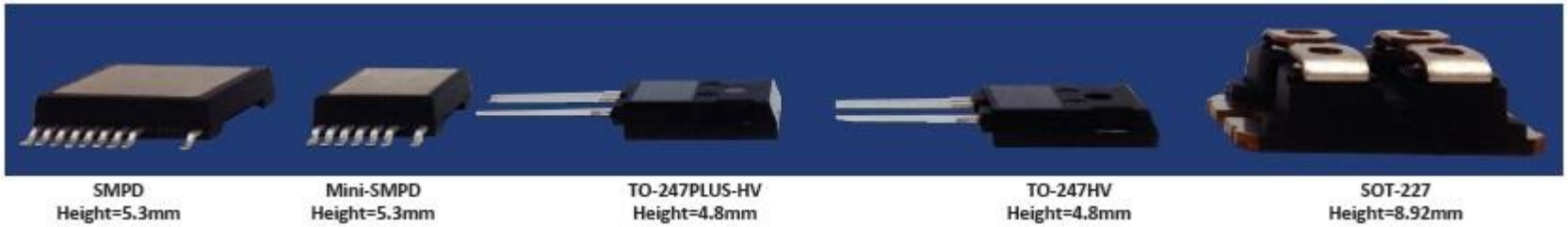
Product Line Introduction (1500V MOS-Gated Thyristors)



- Designed for high-power pulse and capacitive discharge applications
- Switched on by a voltage applied at the gate terminal (MOS structure)
- Capable of carrying current up to 32kA for a period of 1 microsecond
- Anti-parallel diodes available
- High power densities
- Low gate drive requirements
- Available in proprietary packages:
  - surface mountable SMPD and Mini-SMPD
  - high-voltage versions of the international standard TO-247: TO-247HV and TO-247PLUS-HV

Technology Advantages

Proprietary SMPD and high-voltage packages



Size and volume comparison of IXYS packages with the conventional SOT-227

SMPD Advantages

- Ultra-low and compact package profile
- Surface mountable via standard reflow process
- Low package weight (SMPD: 8g, Mini-SMPD: 5g)
- Low package inductance
- Excellent thermal performance
- High power cycling capability

TO-247HV and TO-247PLUS-HV

- Increased creepage distance between leads
- PCB space savings
- Easy to mount
- Arc prevention in high voltage applications

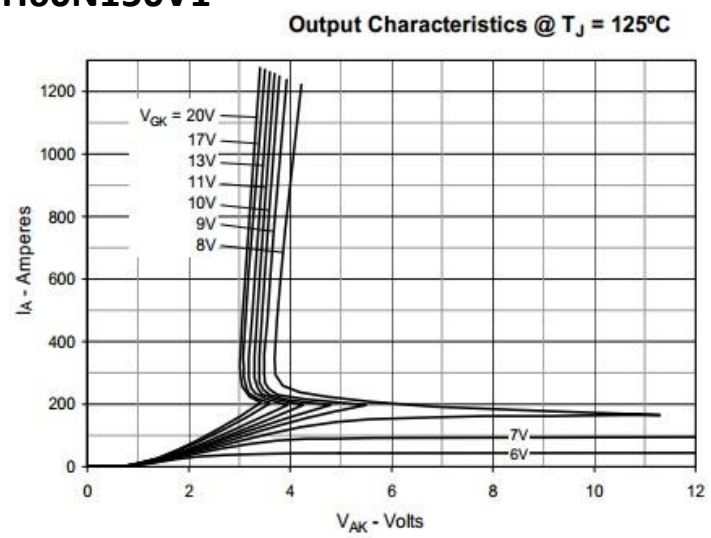
Direct Copper Bond (DCB) isolation

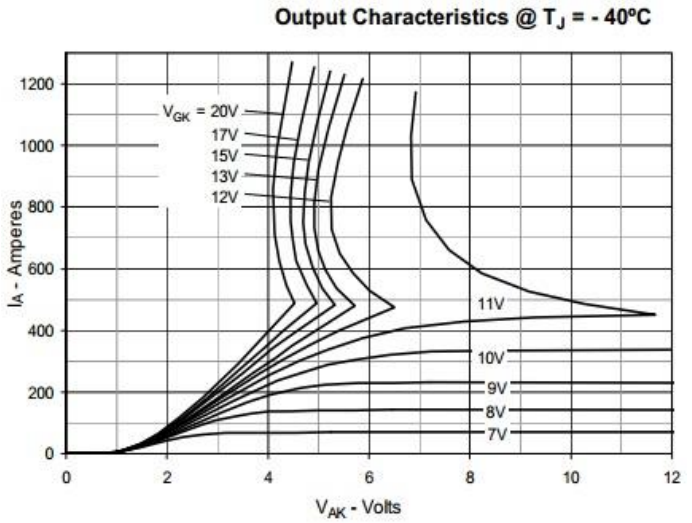
- Provides 2500V ceramic isolation
- Improves temperature and power cycling capabilities
- Reduces EMI/RFI due to low coupling capacitance
- Lowers thermal resistance (R_{thJS})
- Allows new circuit configurations

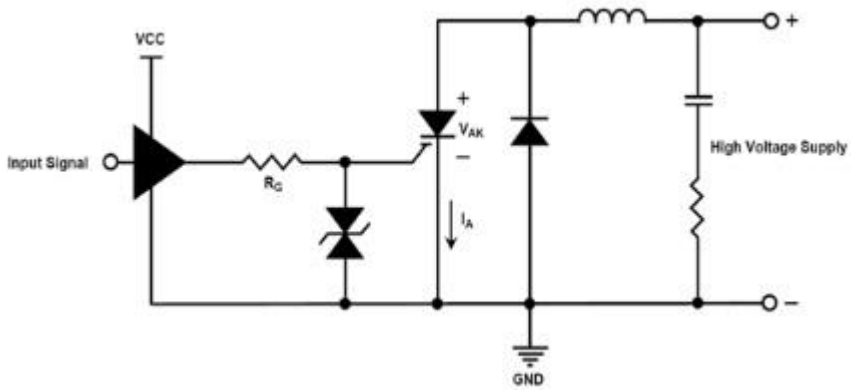
Illustration of DCB in SMPD packaging technology

Characteristics and Performance

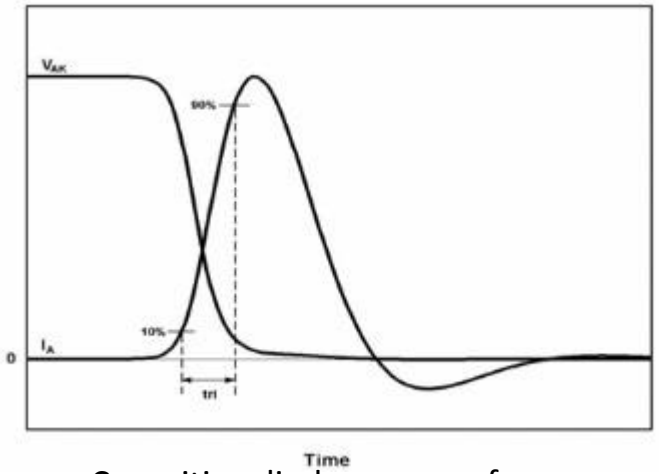
MMIX1H60N150V1







Capacitive discharge circuit



Capacitive discharge waveform

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	50	ns

1500V MOS-Gated Thyristors: Summary Table

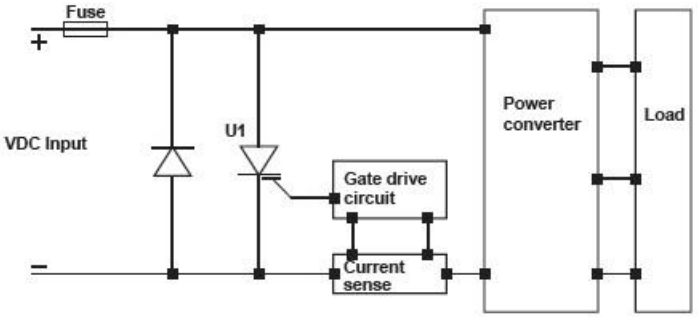
Available Parts

Part Number	V_{DM} (V)	I_{TSM} 1µs T_C=25°C (kA)	I_{TSM} 10µs T_C=25°C (kA)	r_T typ (mΩ)	V_T max (V)	$Q_{g(on)}$ typ (nC)	t_{rl} typ T_J=25°C (ns)	$V_{GE(th)}$ max (V)	Configuration	Package Style
IXHH40N150HV	1500	7.6	3.5	1.2	7.5	99	100	5	Single	TO-247HV
IXHX40N150V1HV	1500	7.6	3.5	1.2	7.5	99	100	5	Copacked	TO-247PLUS-HV
MMJX1H40N150	1500	15.5	6.4	1.2	6	99	100	5	Single	Mini-SMPD
MMIX1H60N150V1	1500	32	11.8	1.2	6	180	100	5	Copacked	SMPD

Applications

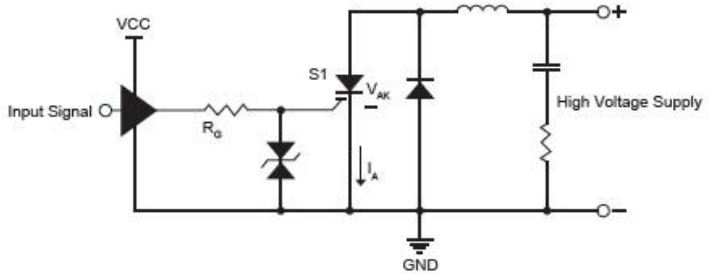
For high-power capacitive discharge or solid-stage surge protection applications in aerospace, medical, and industrial settings

Overcurrent protection circuit



- Capacitive discharge circuits
- Ignition circuits
- Solid state surge protection

Capacitive discharge circuit



WORLD OF IXYS

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Strong Product Promotion and Focus

Joint Strategic and Marketing Programs

Broad Technologies with Strong Power Solutions

Great Partner for Demand Creation

Creating New Products For Today and Tomorrow's Needs

IXYS POWER, IC, and Microcontroller Solutions