SCRs
8 Amp RMS, Plastic

FEATURES

- Voltage Ratings: to 200V
- Forward Current: 0.8A RMS
- Surge Current: 6A, 8ms
- Gate Sensitivity: 200μa max.
- Planar Passivated Process
- TO-92 Plastic Package

DESCRIPTION

This plastic series features very fast switching performance, low forward voltage drop and a high degree of reliability and parameter stability. All units are fully planar passivated and are packaged in a rugged TO-92 case, constructed from a special epoxy compound that features excellent moisture resistance providing stable performance under high humidity conditions and good thermal transfer characteristics.
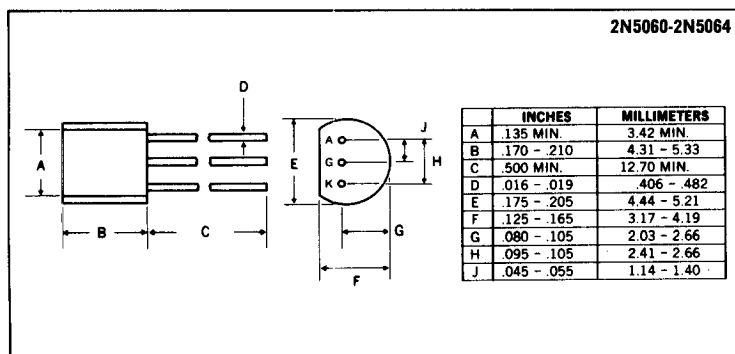
TYPICAL APPLICATIONS

Lamp Driving	Process Controls	Remote Controls
Relay Driving	Pressure Controls	High Current SCR Driving
Relay Replacement	Display Systems	Timers
Alarm Systems	Touch Switches	Temperature Controls
Counters	and many other current sensing and control applications.	

ABSOLUTE MAXIMUM RATINGS

	2N5060	2N5061	2N5062	2N5063	2N5064
Repetitive Peak Off-State Voltage, V_{DRM}	30V	60V	100V	150V	200V
Repetitive Peak Reverse Voltage, V_{RRM}	30V	60V	100V	150V	200V
On-State Current, $I_{T(RMS)}$			0.8A		
Peak One Cycle Surge (Non-Rep.) On-State Current, I_{TSM}			6A		
Peak Gate Current, I_{GM}			1.0A		
Peak Gate Power, P_{GM}			1W		
Average Gate Power $P_{G(AV)}$			0.01W		
Reverse Gate Voltage, V_{GR}			6V		
Storage Temperature Range			—65°C to +150°C		
Operating Temperature Range			—65°C to +125°C		

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MECHANICAL SPECIFICATIONS

2N5060-2N5064

	INCHES	MILLIMETERS
A	.135 MIN.	3.42 MIN.
B	.170 - .210	4.31 - 5.33
C	.500 MIN.	12.70 MIN.
D	.016 - .019	.406 - .482
E	.175 - .205	4.44 - 5.21
F	.125 - .165	3.17 - 4.19
G	.080 - .105	2.03 - 2.66
H	.095 - .105	2.41 - 2.66
J	.045 - .055	1.14 - 1.40

TO-92

UNITRODE

ELECTRICAL SPECIFICATIONS (at 25°C unless noted

| Test	Symbol	Min.	Typical	Max.	Units	Test Conditions
Off-State Current	I_{DRM}	—	0.1	1.0	μA	V_{DRM} = Rating R_{GK} = 1KΩ
		—	—	50	μA	V_{DRM} = Rating, T = 125°C
Reverse Current	I_{RRM}	—	0.1	1.0	μA	V_{RRM} = Rating R_{GK} = 1KΩ
		—	—	50	μA	V_{RRM} = Rating, T = 125°C
Gate Trigger Current	I_{GT}	—	—	200	μA	V_D = 7V, R_L = 100 ohms R_{GS} = 10KΩ
		—	—	350	μA	V_D = 7V, R_L = 100 ohms, T = —65°C
Gate Trigger Voltage	V_{GT}	—	0.6	0.8	V	V_D = 7V, R_L = 100 ohms R_{GS} = 10KΩ
		—	—	1.2	V	V_D = 7V, R_L = 100 ohms, T = —65°C
		0.1	—	—	V	V_D = Rating, R_L = 100 ohms, T = 125°C
Peak On-State Voltage	V_{TM}	—	1.2	1.7	V	I_{TM} = 1 Amp Pulse
Holding Current	I_H	—	0.7	5.0	mA	V_D = 7V, T = 25°C
		—	—	10.0	mA	V_D = 7V, T = —65°C
Critical Rate of Rise — Off-State Voltage	dv/dt	—	75	—	$V/\mu s$	V_D = Rated
Turn-on Time	t_{on}	—	0.1	—	μs	I_G = 10mA, I_T = 1A, V_D = 30V
Circuit Commutated Turn-off Time	t_q	—	8	—	μs	$I_T = I_R$ = 1A

Note: Blocking voltage ratings apply over the full operating temperature range, provided the gate is connected to the cathode through a resistor, 1000 ohms or smaller, or other adequate bias is used.

DESIGN CONSIDERATIONS

1. The 2N5060 Series SCRs are guaranteed to block their rated voltage over the rated operating temperature when a resistance of 1000 ohms or less is connected from gate to cathode as shown.
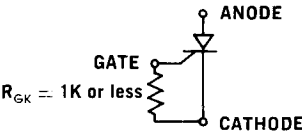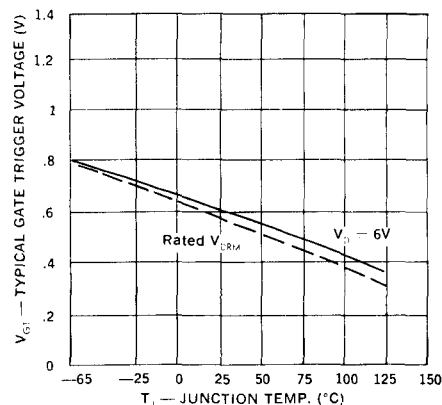

2. In cases where the SCR may be subjected to fast rising anode voltages a capacitor can be connected between anode or gate and cathode as shown, to serve as protection against dv/dt firing.
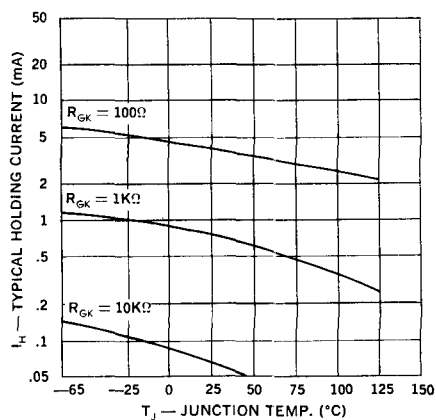
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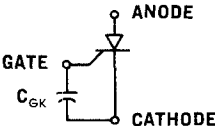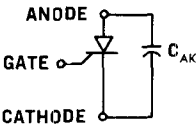
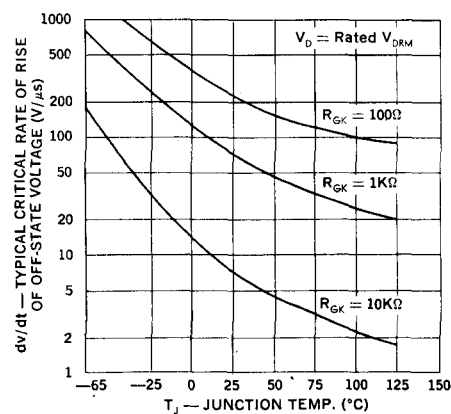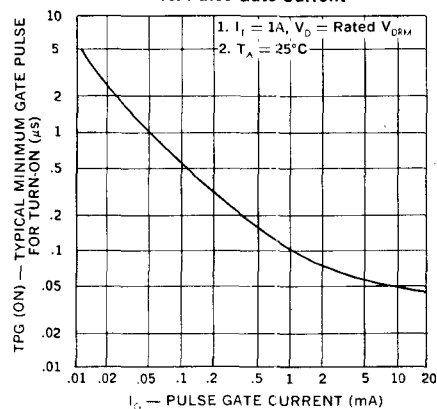### Gate Trigger Current vs. Junction Temp.

I_{GT} — TYPICAL GATE TRIGGER CURRENT (μA)

$V_D = 6V$

Rated V_{DRM}
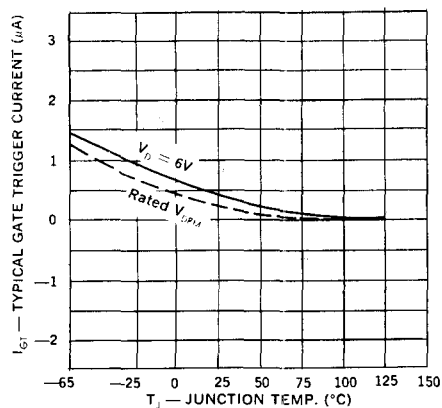
T_J — JUNCTION TEMP. (°C)

Gate Trigger Voltage vs. Junction Temp.

V_{GT} — TYPICAL GATE TRIGGER VOLTAGE (V)

Rated V_{DRM}

$V_D = 6V$

T_J — JUNCTION TEMP. (°C)

Holding Current vs. Junction Temp.

I_H — TYPICAL HOLDING CURRENT (mA)

$R_{GK} = 100\Omega$

$R_{GK} = 1K\Omega$

$R_{GK} = 10K\Omega$

T_J — JUNCTION TEMP. (°C)

dv/dt vs. Junction Temp.

dv/dt — TYPICAL CRITICAL RATE OF RISE OF OFF-STATE VOLTAGE (V/μs)

V_D = Rated V_{DRM}

$R_{GK} = 100\Omega$

$R_{GK} = 1K\Omega$

$R_{GK} = 10K\Omega$

T_J — JUNCTION TEMP. (°C)

Gate Pulse For Turn-On vs. Pulse Gate Current

TPG (ON) — TYPICAL MINIMUM GATE PULSE FOR TURN-ON (μs)

1. $I_f = 1A$, V_D = Rated V_{DRM}
2. $T_A = 25°C$

I_G — PULSE GATE CURRENT (mA)

Forward Blocking Recovery Time vs. Junction Temp.

t_q — CIRCUIT COMMUTATED TURN-OFF TIME (μs)

$I_T = 1A$, $I_R = 1A$, $R_{GK} = 1K$

T_J — JUNCTION TEMP. (°C)

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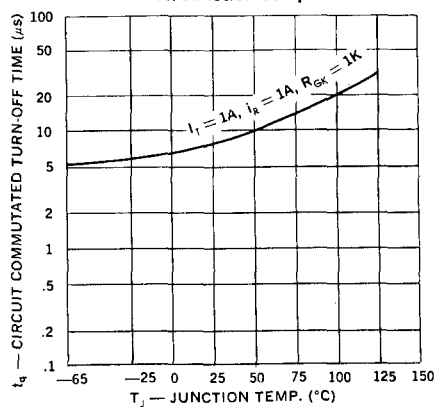
Current vs. On-State Voltage

I_T — ON-STATE CURRENT (A)

$T_J = 25°C$ $T_J = 125°C$

V_T — TYPICAL ON-STATE VOLTAGE (V)
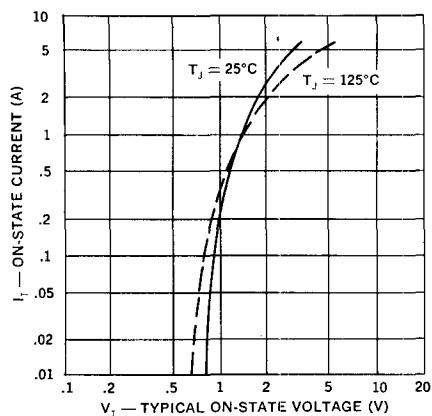
Current vs. Power Dissipation

$I_{T(av)}$ — AVERAGE ON-STATE CURRENT (A)

Junction Temperature = 125°C

DC
180°
120°
90°
60°
30°

Conduction angle

Conduction angle

W — MAXIMUM ON-STATE POWER DISSIPATION (W)

Current vs. Ambient Temp.

$I_{T(av)}$ — AVERAGE ON-STATE CURRENT (A)

Unit mounted with leads vertical in free air.

Conduction angle

DC

Conduction angle = 180°

120°
90°
60°
30°

$T_{A\,max}$ — MAX. AMBIENT TEMPERATURE (°C)

Current vs. Case Temp.

$I_{T(av)}$ — AVERAGE ON-STATE CURRENT (A)

Case Temperature measured at center of flat side of device body.

DC

Conduction angle = 180° Conduction angle

120°
90°
60°
30°

$T_{C\,max}$ — MAX. CASE TEMPERATURE (°C)

Current vs. Heatsink Temp.

$I_{T(av)}$ — AVERAGE ON-STATE CURRENT (A)

1. Unit mounted in center of 1″ x 1″ x 1/16″ aluminum heatsink using epoxy adhesive. Unit mounted flat side against heatsink.
2. Heatsink temperature measured 1/8″ from unit.

DC

Conduction angle

CONDUCTION ANGLE = 180°
120°
90°
60°
30°

MAXIMUM HEATSINK TEMPERATURE (°C)
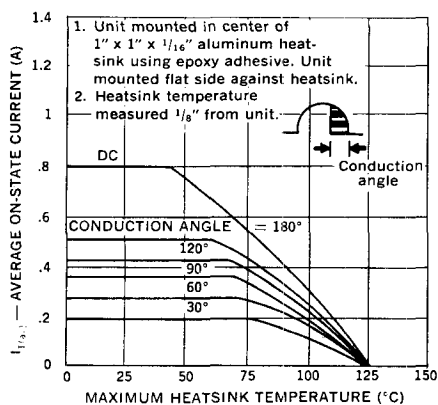
Surge Rating vs. Pulse Duration

I_{FRM} — NON-REPETITIVE PEAK ON-STATE CURRENT (A)

Surge Pulse is half sine wave.

$T_J = -65°C$ to $+125°C$

Pulse duration

PULSE DURATION

.1μs 1μs 10μs 100μs 1ms 10ms 100ms