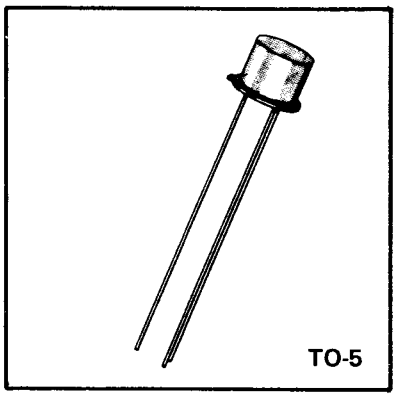
SILICON PLANAR

REVERSE BLOCKING TRIODE THYRISTORS

(SCRs)



DESIGN FEATURES

- Operation to 150°C
- Low Leakage
- High Gate Sensitivity

Transitron's hermetically sealed, 2N3555 SCR series is designed specifically for those industrial and consumer applications where excellent electrical performance and high reliability are companion requirements. These SCRs are exceptionally well suited to such applications as solenoid and lamp drivers, temperature controllers, voltage and current sensing, motor control, and many other current and voltage switching requirements.

REPETITIVE PEAK OFF-STATE VOLTAGE (V_{DRM}) and REPETITIVE PEAK REVERSE VOLTAGE (V_{RRM})

Symbol	2N 3555	2N 3556	2N 3557	2N 3558	Test Conditions
V_{DRM} – VOLTS	30	60	100	200	T_A = 150°C & R_{GK} = 1K
V_{RRM} – VOLTS	30	60	100	200	

ABSOLUTE MAXIMUM RATINGS @ T_C = 100°C

Definitions	Symbol	Limits
Average On-State Current	$I_{T(AV)}$	1.0 A
RMS On-State Current	$I_{T(RMS)}$	1.6 A
Peak One-Cycle Surge Current (60 Hz)	I_{TSM}	18.0 A
Peak Reverse Gate Voltage	V_{GRM}	5.0 V
Peak Gate Power	P_{GM}	500 mW
Average Gate Power	$P_{G(AV)}$	100 mW
Operating Temperature Range	t_{op}	–65 to +150°C
Storage Temperature Range	T_{stg}	–65 to +200°C

ELECTRICAL CHARACTERISTICS

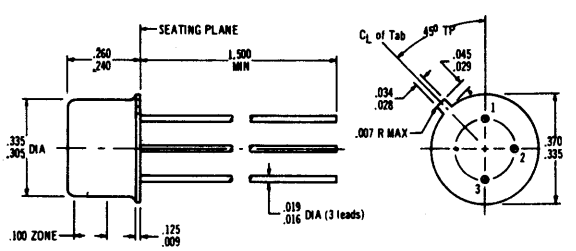
PARAMETERS			LIMITS		TEST CONDITIONS			
Symbol	Units	Definitions	Min.	Max.	T °C	R_{GK} ohms	V_{AA} volts	Other Conditions
V_{TM}	Volts	Max. On-State Voltage	–	1.4	25	–	–	I_{TM} = 1.6 A peak
I_{DRM}	μA	Rep. Peak Off-State Current	–	0.02	25	1K	V_{DRM}	
			–	20	150	1K	V_{DRM}	
I_{RRM}	μA	Rep. Peak Reverse Current	–	0.1	25	1K	V_{RRM}	
			–	100	150	1K	V_{RRM}	
I_{GT}	μA	Gate Trigger Current	–	20	25	∞	6	
V_{GT}	Volts	Gate Trigger Voltage	–	0.7	25	∞	6	
I_H	mA	Holding Current	–	3.0	25	1K	6	
I_{GR}	μA	Gate Reverse Current	–	0.1	25	∞	OPEN	V_{GC} = –5 volts
dv/dt	V/μs	Rate of rise of V_{DRM}	100*	–	25	1K	V_{DRM}	

*Typical

NOTE
FOR CHARACTERISTIC CURVES FOR THIS FAMILY REFER TO THE END OF THIS GROUP OF SPECIFICAITONS.

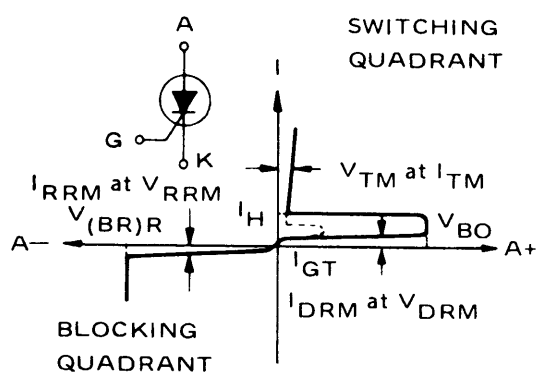
PACKAGING DATA

JEDEC TO-5 OUTLINE



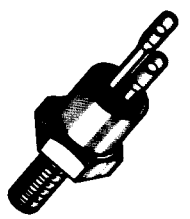
PIN CONNECTIONS
1. Cathode
2. Gate
3. Anode (connected to case)

V-I CHARACTERISTICS



REVERSE BLOCKING TRIODE THYRISTORS

(SCRs)



TO-64

DESIGN FEATURES

- Blocking voltage to 500 V
- Peak pulse current to 100 A
- Turn-off time under 8 μsec
- Hard-bonded construction

Transitron's hermetically sealed 2N3936 fast switching SCR series is designed specifically for those military and industrial applications where excellent electrical performance and high reliability are companion requirements. These SCRs are exceptionally well suited to such applications as radar modulators, inverters and many other high speed or pulse circuits.

REPETITIVE PEAK OFF-STATE VOLTAGE (V_{DRM}) and REPETITIVE PEAK REVERSE VOLTAGE (V_{RRM})

Symbol	2N 3936	2N 3937	2N 3938	2N 3939	2N 3940	Test Conditions
V_{DRM} – VOLTS	100	200	300	400	500	T_C = 125°C
V_{RRM} – VOLTS	100	200	300	400	500	

ABSOLUTE MAXIMUM RATINGS @ T_C = 80°C

Definitions	Symbol	Limits
Average On-State Current	$I_{T(AV)}$	7 A
RMS On-State Current	$I_{T(RMS)}$	10 A
Peak One-Cycle Surge Current (60 Hz)	I_{TSM}	100 A
Peak Gate Power	P_{GM}	10 W
Average Gate Power	$P_{G(AV)}$	500 mW
Operating Temperature Range	T_{op}	−65 to +125°C
Storage Temperature Range	T_{stg}	−65 to +150°C

FAST SWITCHING SCRs

ELECTRICAL CHARACTERISTICS

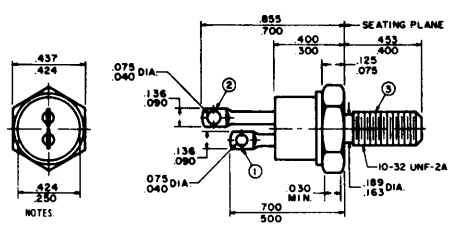
PARAMETERS			LIMITS		TEST CONDITIONS			
Symbol	Units	Definitions	Min.	Max.	T °C	R_{GK} ohms	V_{AA} volts	Other Conditions
V_{TM}	Volts	Max. On-State Voltage	–	2.3	25	–	–	I_{TM} = 7 A peak
I_{DRM}	mA	Rep. Peak Off-State Current	–	0.2	25	∞	V_{DRM}	
			–	1	125	∞	V_{DRM}	
I_{RRM}	mA	Rep. Peak Reverse Current	–	0.2	25	∞	V_{RRM}	
			–	1	125	∞	V_{RRM}	
I_{GT}	mA	Gate Trigger Current	–	60	25	∞	12	
V_{GT}	Volts	Gate Trigger Voltage	–	3.2	25	∞	12	
I_H	mA	Holding Current	–	110	25	∞	12	
T_{GT}	μs	Turn-on Time	–	3		∞	100	I_G = 100 mA
T_Q	μs	Turn-off Time	–	8	125	∞	30	I_{TM} = I_R = 5 A
dv/dt	V/μs	Rate of rise of V_{DRM}	250*	–	25	∞	V_{DRM}	

*Typical

NOTE
FOR CHARACTERISTIC CURVES FOR THIS FAMILY REFER TO THE END OF THIS GROUP OF SPECIFICATIONS.

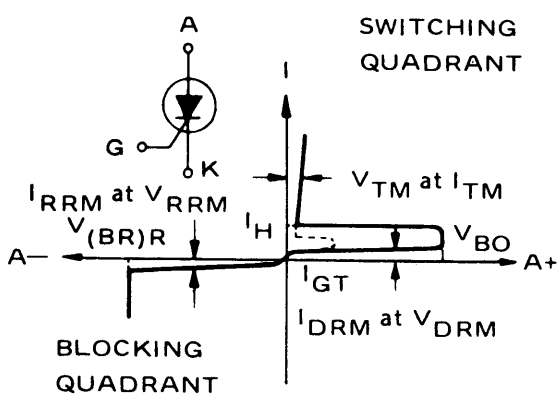
PACKAGING DATA

JEDEC TO-64 OUTLINE



PIN CONNECTIONS
1. Gate
2. Cathode
3. Anode

V-I CHARACTERISTICS



SILICON PLANAR

REVERSE BLOCKING TRIODE THYRISTORS

(SCRs)

TO-52

DESIGN FEATURES

- Gate sensitivity 200 μA
- Blocking voltage to 200 V
- Peak pulse current to 40 A
- dv/dt typically greater than 100 V/μs
- Operating temperature to +125°C

Transitron's 2N4144 series is designed specifically for those military and industrial applications where excellent electrical performance and high reliability are companion requirements. These SCRs are exceptionally well suited to such military and industrial applications as solenoid and lamp drivers, temperature controllers, voltage and current sensing, motor control, and many other current and voltage switching requirements.

REPETITIVE PEAK OFF-STATE VOLTAGE (V_{DRM}) and REPETITIVE PEAK REVERSE VOLTAGE (V_{RRM})

Symbol	2N 4144	2N 4145	2N 4146	2N 4147	2N 4148	2N 4149	Test Conditions
V_{DRM} – VOLTS	15	30	60	100	150	200	T_A = 125°C & R_{GK} = 1.0 kilohms
V_{RRM} – VOLTS	15	30	60	100	150	200	

ABSOLUTE MAXIMUM RATINGS @ T_A = 75°C

Definitions	Symbol	Limits
Average On-State Current	$I_{T(AV)}$	250 mA
RMS On-State Current	$I_{T(RMS)}$	400 mA
Peak One-Cycle Surge Current (60 Hz)	I_{TSM}	5.0 A
Peak Reverse Gate Voltage	V_{GRM}	5.0 V
Peak Gate Power	P_{GM}	200 mW
Average Gate Power	$P_{G(AV)}$	20 mW
Operating Temperature Range	T_{op}	−65 to +125°C
Storage Temperature Range	T_{stg}	−65 to +150°C

ELECTRICAL CHARACTERISTICS

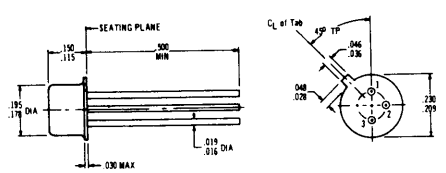
PARAMETERS			LIMITS		TEST CONDITIONS			
Symbol	Units	Definitions	Min.	Max.	T °C	R_{GK} ohms	V_{AA} volts	Test Conditions
V_{TM}	Volts	Max. On-State Voltage	–	2.5	25	–	–	I_{TM} = 800 mA peak
I_{DRM}	μA	Rep. Peak Off-State Current	–	10	25	1K	V_{DRM}	
			–	100	125	1K	V_{DRM}	
I_{RRM}	μA	Rep. Peak Reverse Current	–	10	25	1K	V_{RRM}	
			–	100	125	1K	V_{RRM}	
I_{GT}	μA	Gate Trigger Current	–	200	25	∞	6	
V_{GT}	Volts	Gate Trigger Voltage	–	0.8	25	∞	6	
I_H	mA	Holding Current	–	5.0	25	1K	6	
I_{GR}	μA	Gate Reverse Current	–	1.0*	25	∞	OPEN	V_{GC} = –5 Volts
dv/dt	V/μs	Rate of rise of V_{DRM}	100*	–	25	1K	V_{DRM}	

*Typical

NOTE
FOR CHARACTERISTIC CURVES FOR THIS FAMILY REFER TO THE END OF THIS GROUP OF SPECIFICATIONS.

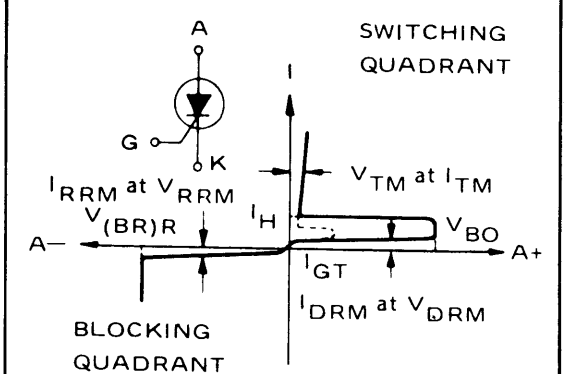
PACKAGING DATA

JEDEC TO-52 OUTLINE



PIN CONNECTIONS
1. Cathode
2. Gate
3. Anode (connected to case)

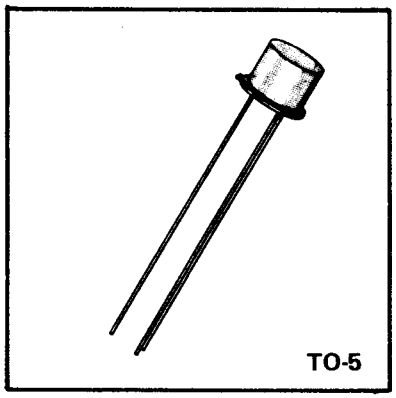
V-I CHARACTERISTICS



SILICON PLANAR

REVERSE BLOCKING TRIODE THYRISTORS

(SCRs)



DESIGN FEATURES

- High gate sensitivity
- Rated to 400 V
- dv/dt typically 100 V/μsec

Transitron's hermetically sealed, 2N4212 SCR series is designed specifically for those industrial and consumer applications where excellent electrical performance and high reliability are companion requirements. These SCRs are exceptionally well suited to such applications as solenoid and lamp drivers, temperature controllers, voltage and current sensing, motor control, and many other current and voltage switching requirements.

REPETITIVE PEAK OFF-STATE VOLTAGE (V_{DRM}) and REPETITIVE PEAK REVERSE VOLTAGE (V_{RRM})

Symbol	2N 4212	2N 4213	2N 4214	2N 4215	2N 4216	2N 4217	2N 4218	2N 4219	Test Conditions
V_{DRM} – VOLTS	25	50	100	150	200	250	300	400	T_A = 125°C & R_{GK} = 1 K
V_{RRM} – VOLTS	25	50	100	150	200	250	300	400	

ABSOLUTE MAXIMUM RATINGS @ T_C = 125°C

Definitions	Symbol	Limits
Average On-State Current	$I_{T(AV)}$	1.0 A
RMS On-State Current	$I_{T(RMS)}$	1.6 A
Peak One-Cycle Surge Current (60 Hz)	I_{TSM}	15 A
Peak Reverse Gate Voltage	V_{GRM}	6.0 A
Peak Gate Power	P_{GM}	100 mW
Average Gate Power	$P_{G(AV)}$	10 mW
Operating Temperature Range	T_{op}	–65 to 125°C
Storage Temperature Range	T_{stg}	–65 to 150°C

ELECTRICAL CHARACTERISTICS

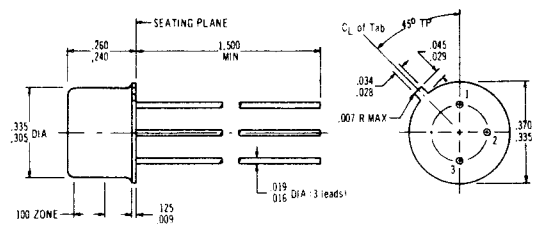
PARAMETERS			LIMITS		TEST CONDITIONS			
Symbol	Units	Definitions	Min.	Max.	T °C	R_{GK} ohms	V_{AA} volts	Other Conditions
V_{TM}	Volts	Max. On-State Voltage	–	2.0	25	–	–	I_{TM} = 3.14 A peak
I_{DRM}	μA	Rep. Peak Off-State Current	–	10	25	1K	V_{DRM}	
			–	200	125	1K	V_{DRM}	
I_{RRM}	μA	Rep. Peak Reverse Current	–	10	25	1K	V_{RRM}	
			–	200	125	1K	V_{RRM}	
I_{GT}	μA	Gate Trigger Current	–	50	25	∞	6	
V_{GT}	Volts	Gate Trigger Voltage	–	0.65	25	∞	6	
I_H	mA	Holding Current	–	5.0	25	1K	6	
I_{GR}	μA	Gate Reverse Current	–	10	25	∞	OPEN	V_{GC} = –5 V
dv/dt	V/μs	Rate of rise of V_{DRM}	100*	–	25	1K	V_{DRM}	

*Typical

NOTE
FOR CHARACTERISTIC CURVES FOR THIS FAMILY REFER TO THE END OF THIS GROUP OF SPECIFICATIONS.

PACKAGING DATA

JEDEC TO-5 OUTLINE



PIN CONNECTIONS
1. Cathode
2. Gate
3. Anode (connected to case)

V-I CHARACTERISTICS