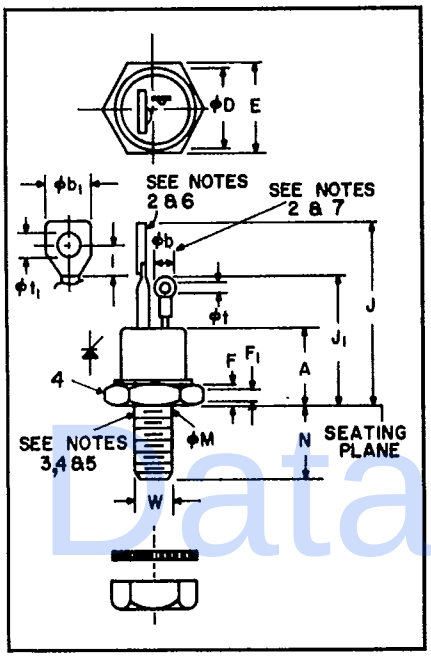
T-25-17

POWEREX

2N5204-2N5207

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272
Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Phase Control SCR
22 Amperes/600-1200 Volts

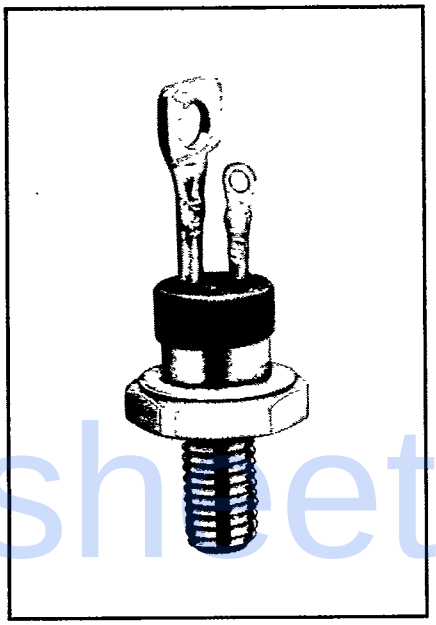


2N5204-2N5207 Outline Drawing
Complies with TO-48

Dimension	Inches Min.	Inches Max.	Metric Min.	Metric Max.
A	.330	.505	8.38	12.83
ϕb ②	.115	.140	2.92	3.56
ϕb1 ②	.210	.300	5.33	7.62
ϕD	—	.544	—	13.82
E	.544	.562	13.82	14.27
F ④	.113	.200	2.87	5.08
F1	.060	—	1.52	—
J	—	1.193	—	30.30
J1	—	.875	—	22.23
L	.120	—	3.05	—
ϕM ①	—	—	—	—
N	.422	.453	10.72	11.51
ϕt	.060	.075	1.52	1.91
ϕt1	.125	.165	3.18	4.19
W ③	—	—	—	—

Notes:
1. Complete threads to extend to within 2½ threads of seating plane. Diameter of unthreaded portion .249" (6.32MM) Maximum, .220" (5.59MM) Minimum.
2. Angular orientation of these terminals is undefined.
3. ¼-28 UNF-2A. Maximum pitch diameter of plated threads shall be basic pitch diameter .2268" (5.76MM), minimum pitch diameter .2225" (5.66MM), reference: screw thread standards for Federal Service 1957, Handbook H28, 1957, P1.
4. A chamfer (or undercut) on one or both ends of hexagonal portion is optional.
5. Case is anode connection.
6. Large terminal is cathode connection.
7. Small terminal is gate connection.
8. Insulating kit available upon request.

A. ¼-28 steel nut, Ni. plated, .178 min. thk.
B. Ext. tooth lockwasher, steel, Ni. plated, .023 min. thk.



2N5204-2N5207
Phase Control SCR
22 Amperes/600-1200 Volts

Description
Powerex Silicon Controlled Rectifiers (SCR) are reverse blocking triode thyristor semiconductor devices designed for power switching and phase control applications. They are all-diffused devices backed by years of design and field experience.

Features:
- ☐ Low Gate Current
- ☐ Low On-State Voltage
- ☐ Hermetic Packaging
- ☐ Low Thermal Impedance
- ☐ Long Creepage Path
- ☐ Thermal Fatigue Resistant
- ☐ Excellent Surge Rating

Applications:
- ☐ Phase Control
- ☐ Power Supplies
- ☐ Static Switch
- ☐ Battery Chargers
- ☐ Motor Control

Ordering Information
Example: Select the complete 6 digit part number you desire from the table — i.e. 2N5206 is a 1000 Volt, 22 Ampere Phase Control SCR.

Type	Voltage V_{DRM} /V_{RRM}	Current Rating $I_{T(AV)}$ Amperes (22)
2N5204	600	—
2N5205	800	—
2N5206	1000	—
2N5207	1200	—

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Phase Control SCR
22 Amperes/600-1200 Volts

Absolute Maximum Ratings, (T_j=125°C unless otherwise specified)

Ratings	Symbol	2N5204	2N5205	2N5206	2N5207	Units
Repetitive peak off-state voltage	V_{DRM}	600	800	1000	1200	Volts
Repetitive peak reverse voltage	V_{RRM}	600	800	1000	1200	Volts
Non-repetitive peak reverse voltage	V_{RSM}	720	960	1200	1440	Volts

		2N5204-2N5207	
RMS On-State Current	$I_{T(RMS)}$	35	Amperes
Average On-State Current (Nominal, See Charts) T_c=40°C	$I_{T(AV)}$	22	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60 Hz)	I_{TSM}	300	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50 Hz)	I_{TSM}	272	Amperes
I^2t (for Fusing), 8.3 ms	I^2t	375	A^2sec
I^2t (for Fusing), 1.0 ms	I^2t	200	A^2sec
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	100	A/μs
Peak Gate Power Dissipation	P_{GM}	60	Watts
Average Gate Power Dissipation	$P_{G(AV)}$	10	Watts
Peak Reverse Gate Voltage	V_{RGM}	5	Volts
Storage Temperature	T_{stg}	-40 to 150	°C
Operating Temperature	T_j	-40 to 125	°C
Mounting Torque ①	—	30	in.-lb.
Mounting Torque ①	—	35	kg-cm

① Consult recommended mounting procedures; do not exceed maximums.

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2N5204-2N5207
Phase Control SCR
22 Amperes/600-1200 Volts

Electrical Characteristics

Characteristics	Symbol	Test Conditions	2N5204	2N5205	2N5206	2N5207	Units
Voltage—Blocking State Maximums							
Forward Leakage, Peak	I_{DRM}	T_j=-40°C to 125°C, V_D=V_{DRM}	3.3	2.5	2.0	1.7	mA
Reverse Leakage, Peak	I_{RRM}	T_j=-40°C to 125°C, V_R=V_{RRM}	3.3	2.5	2.0	1.7	mA
				2N5204-2N5207			
Current—Conducting State Maximums							
Peak On-State Voltage	V_{TM}	T_C=25°C, I_{TM}=70 A		2.3			Volts
Holding Current	I_H	V_D=24V, R_L=20Ω, T_j=25°C		100			mA
		V_D=24V, R_L=20Ω, T_j=-40°C		200			mA
Switching							
Typical Turn-Off Time	t_q	—		75			μs
Typical Critical dv/dt exponential to V_{DRM}	dv/dt	T_j=125°C, Gate Open		100			V/μs
Thermal							
Maximum Thermal Resistance, Junction to Case	$R_{th(j-c)}$			1.5			°C/Watt
Gate — Maximum Parameters							
Gate Current to Trigger	I_{GT}	V_D=12V, R_L=12Ω, T_j=25°C		40			mA
		V_D=12V, R_L=12Ω, T_j=-40°C		80			mA
Gate Voltage to Trigger	V_{GT}	V_D=12V, R_L=12Ω, T_j=25°C		3			Volts
Minimum Non-Triggering Gate Voltage	V_{GD}	V_D=½ V_{DRM}, T_j=25°C		0.3			Volts

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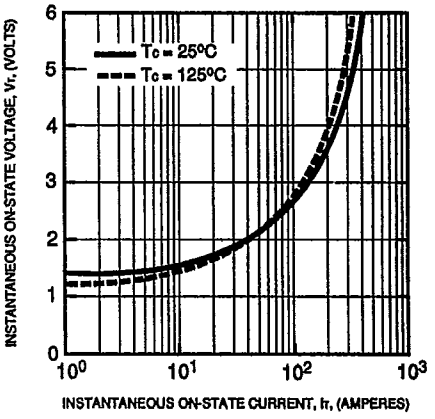
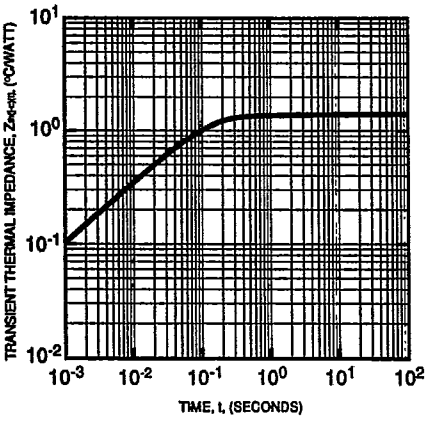
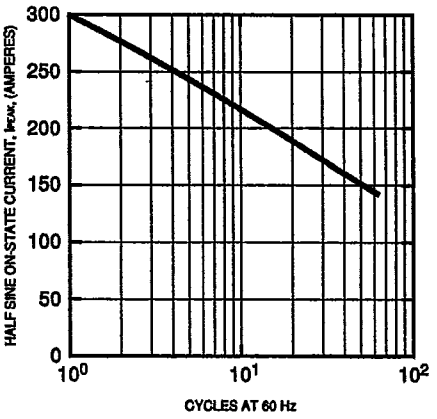
MAXIMUM ON-STATE CHARACTERISTICS



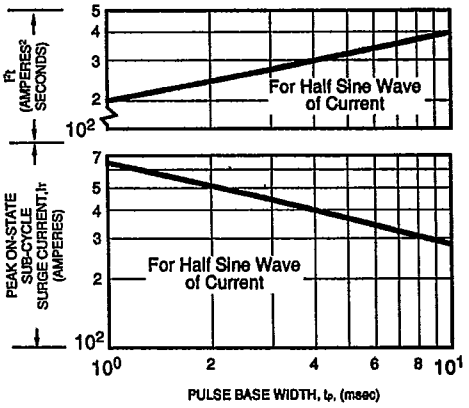
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



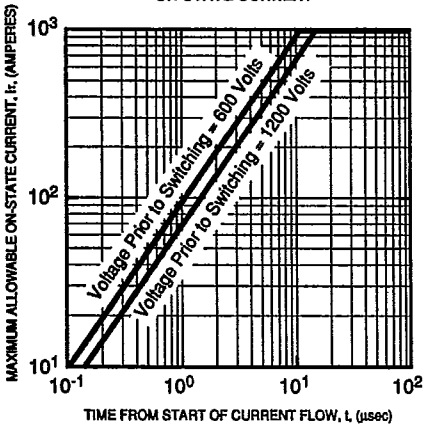
MAXIMUM ALLOWABLE SURGE ON-STATE CURRENT (NON-REPETITIVE)



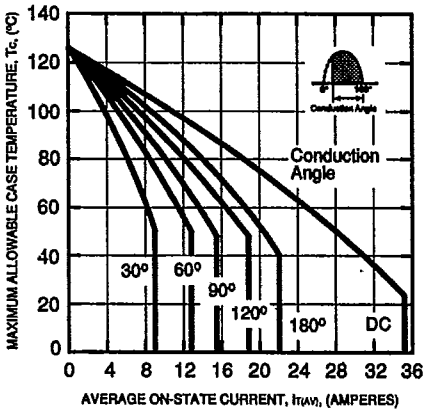
MAXIMUM ALLOWABLE SUB-CYCLE SURGE ON-STATE CURRENT AND I^2t RATING (NON-REPETITIVE)



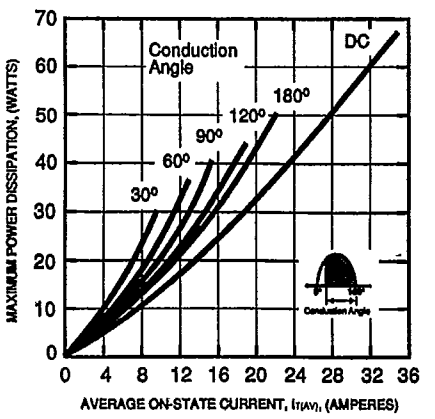
MAXIMUM ALLOWABLE RATE OF RISE OF ON-STATE CURRENT



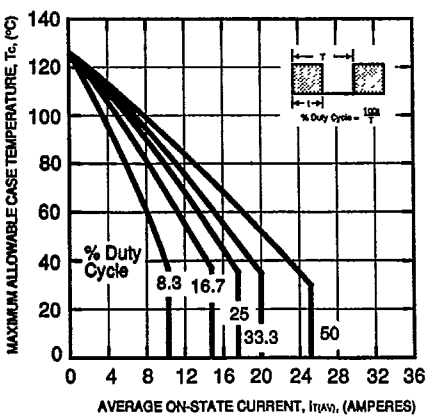
MAXIMUM ALLOWABLE CASE TEMPERATURE (HALF SINUSOIDAL WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (HALF SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)