

SILICON CONTROLLED RECTIFIER / INVERTER

- $dv/dt - 200\text{ V}/\mu\text{sec}$
- 1000 Amperes surge current
- Low forward on-state voltage
- Blocking voltages up to 600V
- Primarily for forced commutated applications

DEVICES

03902GPF 03904GPF 03906GPF

LEVELS

ABSOLUTE MAXIMUM RATINGS ($T_C = +25^\circ\text{C}$ unless otherwise noted)

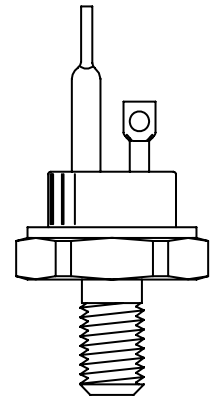
Parameters / Test Conditions	Symbol	Value	Unit
Repetitive Forward Voltage	V_{DRM}	03902GPF	200
		03904GPF	400
		03906GPF	600
Repetitive Reverse Voltage	V_{RRM}	03902GPF	200
		03904GPF	400
		03906GPF	600
Reverse Transient Blocking Voltage	V_{RSM}	03902GPF	300 min
		03904GPF	500 min
		03906GPF	700 min
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.35	$^\circ\text{C}/\text{W}$
Typical Thermal Resistance (greased)	$R_{\theta CS}$	0.20	$^\circ\text{C}/\text{W}$
Mounting Torque		25 - 30	inch pounds
Weight		0.56	oz
Operating Junction Temperature Range	T_J	-65°C to 125°C	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65°C to 155°C	$^\circ\text{C}$

NOTE:

To specify dv/dt other than 200V/ μsec ., enter appropriate letter in place of "G":
 K 300V/ μsec ., H 500V/ μsec

ELECTRICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise noted)

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
RMS On-State Current $T_C = 105^\circ\text{C}$, $R_{\theta JC} = 0.35^\circ\text{C}/\text{W}$	$I_{T(RMS)}$		63	A
Average On-State Current $T_C = 105^\circ\text{C}$, $R_{\theta JC} = 0.35^\circ\text{C}/\text{W}$	$I_{T(AV)}$		40	A
Peak on-state Voltage $I_{TM} = 120\text{A}$	V_{TM}		1.8	V
Holding Current	I_H		500	mA
Peak One Cycle Surge Current $T_C = 105^\circ\text{C}$, 60Hz	I_{TSM}		1000	A
I^2t capability for Fusing $t = 8.3\text{ms}$	I^2t		4150	A^2S



TO-208A (TO-65)

TRIGGERING CHARACTERISTICS ($T_j = +25^\circ\text{C}$, $t_p = 10\mu\text{s}$ unless otherwise noted)

Parameters / Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Gate voltage to Trigger	V_{GT}			3.0	V
Typical gate voltage to Trigger	V_{GT}		1.0		V
Nontriggering gate voltage $T_j = +125^\circ\text{C}$	V_{GD}			0.15	V
Gate current to Trigger	I_{GT}			150	mA
Typical gate current to Trigger	I_{GT}		48		mA
Peak gate power	P_{GM}			10	W
Average gate power	$P_{G(AV)}$		2.0		W
Peak gate current	I_{GM}			3.0	A
Peak gate voltage (forward)	V_{GM}			20	V
Peak gate voltage (reverse)	V_{GM}			10	V

BLOCKING

Parameters / Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Leakage Current $T_j = +125^\circ\text{C} @ V_{DRM}$	I_{DRM}			12	mA
Reverse Leakage $T_j = +125^\circ\text{C} @ V_{RRM}$	I_{RRM}			12	mA
Critical rate of rise of off-state voltage $T_j = +125^\circ\text{C}$	dv/dt			200	V/ μs

SWITCHING CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Critical rate of rise of on-state current (note 1) $T_j = +125^\circ\text{C}$	di/dt			400	A/ μs
Typical delay time (note 1)	t_d		2.0		μs
Maximum circuit commuted turn-off time (note 2)	$t_q(P)$ $t_q(U)$			15 20	μs

NOTE:

- $I_{TM} = 50\text{A}$, $V_D = V_{DR}$, $V_{GT} = 12\text{V}$ open circuit, 20 ohm-0.1 usec. rise time.
- $I_{TM} = 50\text{A}$, $di/dt = -5\text{A}/\mu\text{sec.}$, V_R during turn-off interval = 50V min., reapplied $dv/dt = 20\text{V}/\mu\text{sec.}$, linear to rated V_{DRM} , $V_{GT} = 0\text{V}$.
- To specify t_q other than P = 15 $\mu\text{sec.}$, enter appropriate letter in place of "P", U = 20 $\mu\text{sec.}$

GRAPHS

FIGURE 1
TYPICAL FORWARD ON-STATE CHARACTERISTICS

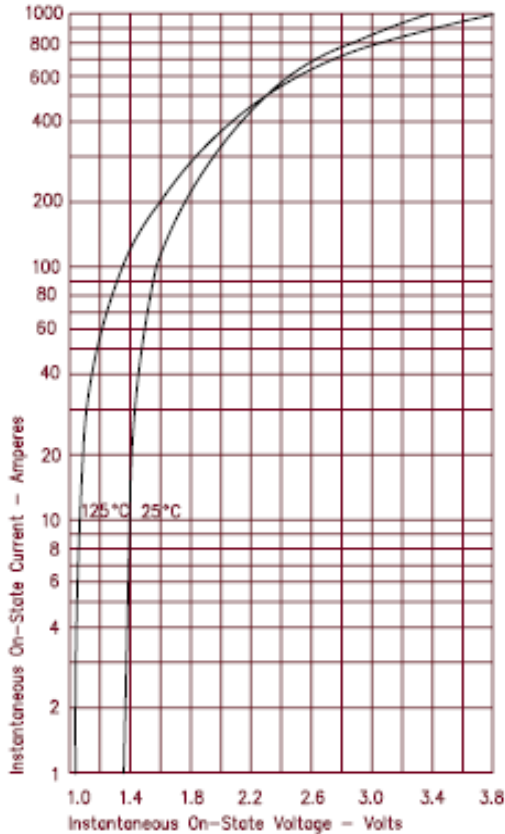


FIGURE 2
FORWARD CURRENT DERATING

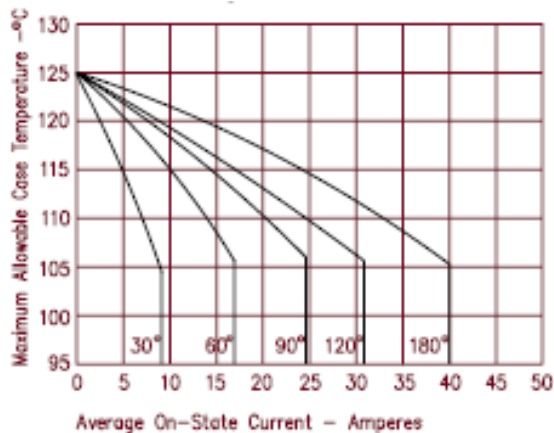


FIGURE 3
MAXIMUM POWER DISSIPATION

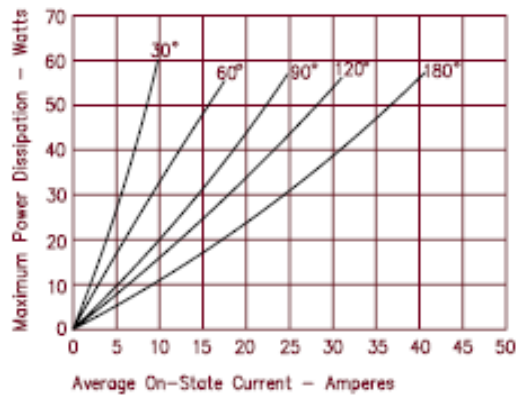


FIGURE 4
TRANSIENT THERMAL IMPEDANCE

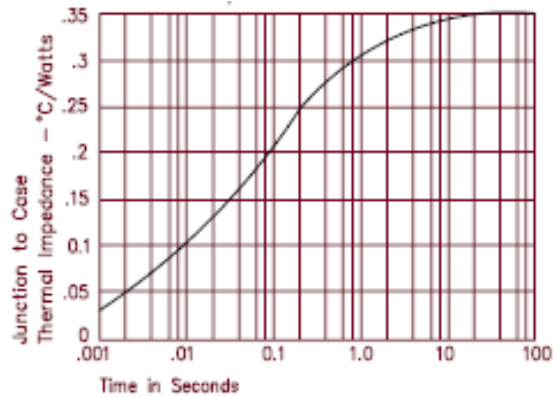
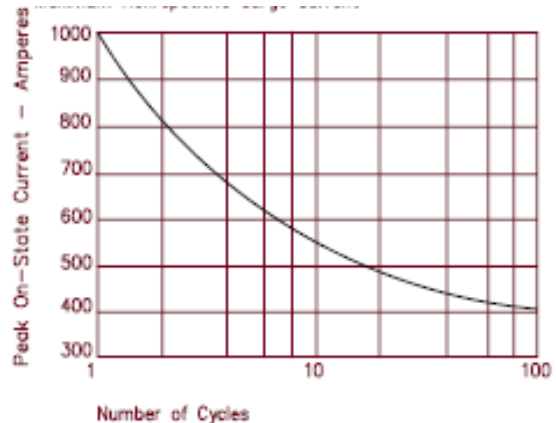
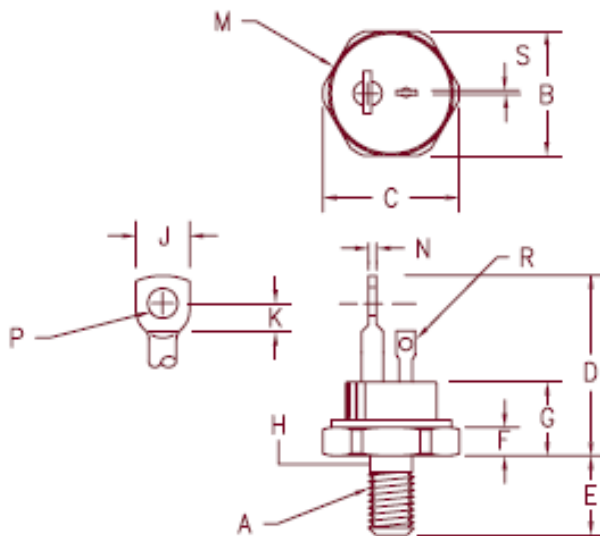


FIGURE 5
MAXIMUM NONREPETITIVE SURGE CURRENT



PACKAGE DIMENSIONS



NOTES:

- 1 ¼ - 28 UNF – 3A
- 2 Full thread within 2 ½ threads

Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
A					1
B	.677	.685	17.20	17.40	
C		.770		19.56	
D	1.200	1.250	30.48	31.75	
E	.427	.447	10.84	11.35	
F	.115	.155	2.92	3.94	
G		.515		13.08	
H		.249		6.32	2
J	.200	.300	5.08	7.62	
K	.120		3.05		
M		.667		16.94	Dia.
N	.065	.085	1.65	2.15	
P	.145	.155	3.68	3.93	Dia.
R	.055	.065	1.40	1.65	Dia.
S	.025	.030	.64	.76	

Physical dimensions TO-208AC(TO-65)