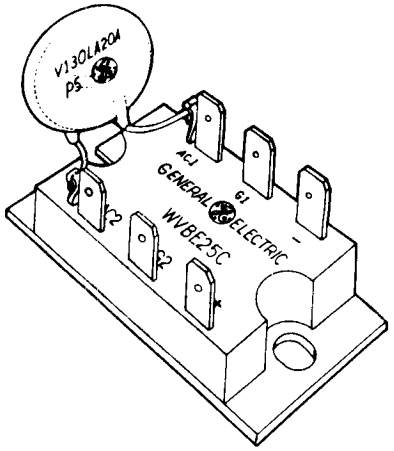


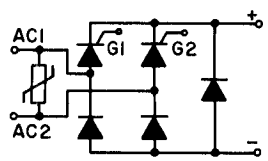
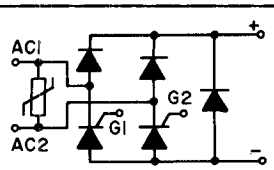
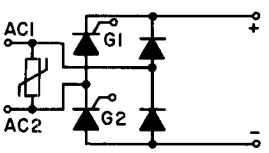
POWER MODULES

New General Electric power modules are miniaturized, self-contained, Epoxy encapsulated modules capable of performing basic AC to DC conversion functions. Typical applications include – DC power supplies, DC motor controls, battery chargers, magnetic clutches and brakes.

All General Electric power modules incorporate Power Glas™ passivated semiconductors with the latest pellet mountdown and interconnect techniques, thereby assuring the utmost in reliability.

COMMON CHARACTERISTICS @ 25°C

Isolation Breakdown	2,500 V_{PEAK}
Surge, Peak One Cycle	300 A
Fusing, I^2t @ 8.3 msec	370 A^2SEC
Gate Current to Trigger (Max.)	40 mA
Gate Voltage to Trigger (Max.)	2.5 V
On-State Current Rate of Rise (di/dt)	100 A/μSEC
Off-State Voltage Rate of Rise (dv/dt)	20 V/μSEC
Operating Temperature	-40 to 125°C

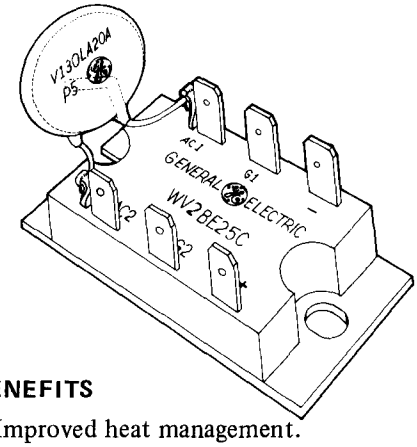
BASIC CIRCUIT SCHEMATIC	I_O AVERAGE @ 85° (A)	V_{IN} (V)	GE TYPES: BASIC CIRCUIT	WITHOUT FREE WHEELING DIODE	WITHOUT GE-MOV ® VARISTOR	WITHOUT EITHER DIODE OR VARISTOR
	25	120	WV2BE25C	WV2BC25C	W2BE25C	W2BC25C
		240	WV2BE25E	WV2BC25E	W2BE25E	W2BC25E
	25	120	WV2BJ25C	WV2BK25C	W2BJ25C	W2BK25C
		240	WV2BJ25E	WV2BK25E	W2BJ25E	W2BK25E
	25	120	WV2BA25C	–	W2BA25C	–
		240	WV2BA25E	–	W2BA25E	–

Phase Control Power Modules

AC-DC Conversion

120 OR 240V AC RMS LINE OPERATION

PHASE CONTROL 25 AMP SERIES



DESCRIPTION

The General Electric Power Module is a new concept of packaging individual power semiconductor pellets in an electrically isolated, epoxy encapsulated package to perform phase controlled circuit functions, controlling resistive or inductive loads.

FEATURES

- Direct bonded copper mountdown for low thermal resistance and mechanical integrity.
- Strike and creep distances meet proposed NEMA Standard (1/16/1972) and U.L. 508 for 240V AC RMS Operation.
- Power-Glas™ passivated silicon pellets for high reliability.
- GE-MOV® Varistor transient over-voltage protection on all base circuits.
- Electrically isolated package (2500V Peak) terminals to base.
- 120V or 240V RMS line operation.
- Maximum rated output of 25 amperes $I_{T(AV)}$ at 85°C base plate temperature $T_{(BP)}$.
- Epoxy encapsulated to provide resistance from mechanical shock and moisture.
- Standard fast-on terminals.

APPLICATIONS

- DC Motor Power Supplies
- Permanent Magnet Motor Controls
- Magnetic Clutches and Brakes
- Industrial Heating
- SCR Phase Controlled Power Supplies
- Battery Charger Power Supplies

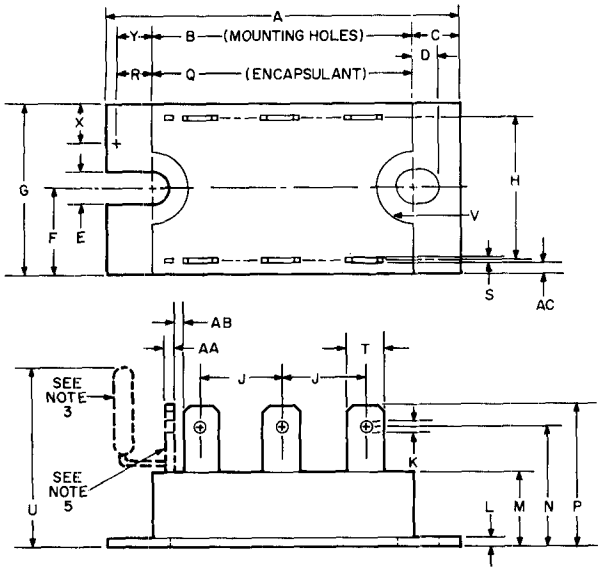
BENEFITS

- Improved heat management.
- Reduced circuit design costs.
- Lower initial costs achieved by reduced packaging costs.
- Reduced inventory costs.
- Lower test cost achieved by testing functional assembly.
- Ease of Installation: Customer provides gating circuit and standard wiring.
- Ease of maintenance.

MARKETS

- Industrial Control
- Machine Tool
- Business Machine
- Computer
- Communication

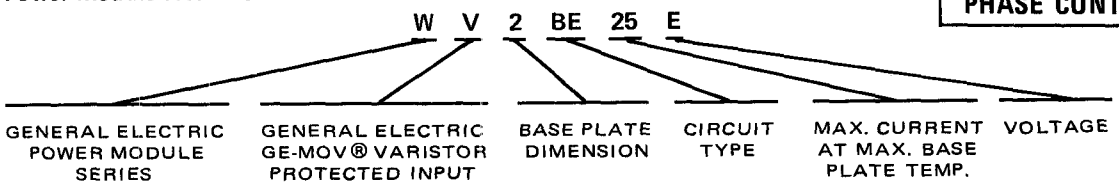
OUTLINE DRAWING



SYM	INCHES MIN.	INCHES MAX.	METRIC MM MIN.	METRIC MM MAX.	NOTES
A	2.485	2.515	63.12	63.88	
B	1.890	1.910	48.01	48.51	
C	.290	.310	7.37	7.87	
D	.155	–	3.94	–	
E	.200	.215	5.08	5.46	
F	.620	.630	15.75	16.00	
G	1.240	1.260	30.50	32.00	
H	1.07	REF.	27.18	REF.	
J	.630	.660	15.87	16.76	
K	.057	.067	1.45	1.70	
L	.055	.070	1.40	1.78	
M	.523	.550	13.28	13.97	
N	.800	.850	20.32	21.59	
P	.965	1.025	24.51	26.04	
Q	–	1.915	–	48.64	
R	.285	–	7.23	–	
S	.027	.037	.69	.94	
T	.245	.255	6.22	6.48	1 & 2
U	–	1.550	–	39.37	3
V	.230	–	5.84	–	
X	–	.310	–	7.37	4
Y	–	.235	–	5.97	4
AA	.065	.085	1.65	2.16	
AB	.040	–	1.02	–	

NOTES:
1. TERMINALS WILL ACCEPT .250 SERIES FAST-ON CONNECTORS.
2. VIEW SHOWS TYPICAL LOCATIONS. SEE CIRCUIT SCHEMATICS AND TERMINAL POSITIONS FOR NUMBER OF TERMINALS AND THEIR LOCATIONS FOR SPECIFIC MODEL.
3. U DIMENSION SHOW MAXIMUM HEIGHT OF VARISTOR. VIEW ONLY SHOWS TYPICAL LOCATION. VARISTOR APPEARS ONLY ON MODELS BEGINNING WITH LETTERS WV.
4. POINTS (X-Y) ARE FOR THERMOCOUPLE PLACEMENT FOR BASE PLATE TEMPERATURE MEASUEMENT.
5. TABS SHOWN ATTACHED TO A.C. TERMINALS ARE INTENDED FOR GE-MOV® VARISTOR ATTACHMENT.

Power Module Nomenclature:



Maximum Average Output Current (Total Bridge, T_{BP} = 85°C) . . . . . 25 Amperes
DC Output Current $I_{T(AV)}$ (Total Bridge) . . . . . Depends on Conduction Angle (See Chart 1,3,4,5)
Critical Rate-Of-Rise of On-State Current, di/dt:[1] . . . . . (See Chart 13)
Gate Triggered Operation-Switching from 500 Volts . . . . . 100 Amperes Per Microsecond
Peak One Cycle Surge (Non-Rep) On-State Current, I_{TSM} 60Hz . . . . . 300 Amperes
I^2t (for fusing), For Times at 8.3 milliseconds . . . (See Chart) . . . . . 370 Ampere² Seconds
1.0 milliseconds . . . . . 260 Ampere² Seconds
Peak Gate Power Dissipation, P_{GM} . . . . . 5 Watts for 10 Microseconds
Average Gate Power Dissipation, $P_{G(AV)}$ . . . . . 0.5 Watts
Peak Positive Gate Current, I_{GM} . . . . . (See Chart 12)
Peak Positive Gate Voltage, V_{GM} . . . . . (See Chart 12)
Peak Negative Gate Voltage, V_{GM} . . . . . 5 Volts
Storage Temperature, T_{STG} . . . . . -40°C to 125°C
Operating Temperature, T_J . . . . . -40°C to 125°C
Isolation Breakdown Voltage Between Any Terminal and Base Plate[2] . . . . . 2500 Volts (Peak)
Minimum Strike and Creep Distance:
Terminal to Terminal . . . . . 0.375 Inch
Terminal to Terminal . . . . . (0.95 CM)
Minimum Strike and Creep Distance:
Terminal to Base Plate . . . . . 0.500 Inch
Terminal to Base Plate . . . . . (1.27 CM)
Maximum Weight . . . . . 2.65 Ounces
Maximum Weight . . . . . (75 Grams)

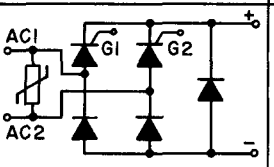
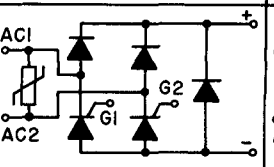
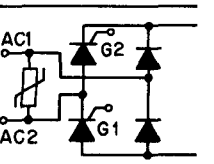
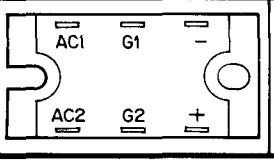
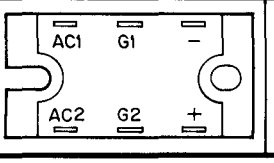
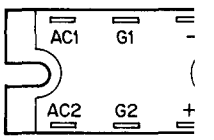
[1] di/dt rating is established in accordance with EIA NEMA Standard RS 397, Section 5.2.2.6. Off-State (blocking) voltage capability may be temporarily lost after each current pulse for duration less than the period of the applied pulse repetition rate. The pulse repetition rate for this test is 400 Hz. The duration of the di/dt test condition is 5 seconds (minimum).

[2] Rating applies for 50, 60 and 400 Hz Sinusoidsl Wave Form.

CHARACTERISTICS

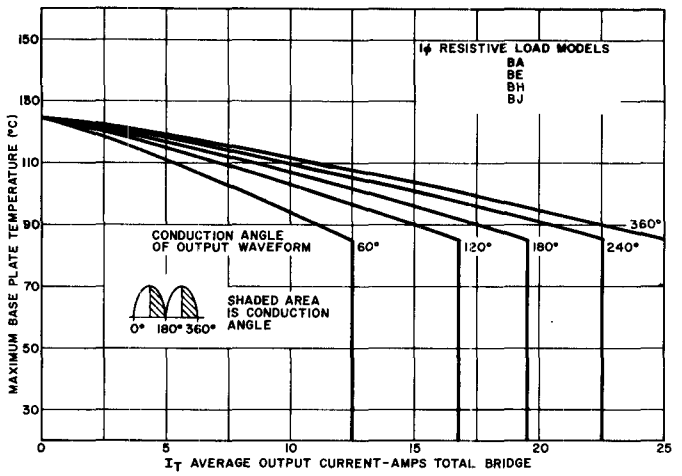
TEST	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Critical Rate-Of-Rise of Off-State Voltage (Higher Values May Cause Device Switching)	dv/dt	20	–	–	Volts/μsec	T_{BP} = 125°C, Rated V_{DRM} Gate Open Circuited, Linear Wave Form
DC Gate Trigger Current	I_{GT}	–	–	40	mAdc	T_{BP} = 25°C, V_D = 12Vdc, R_L = 80Ω
		–	–	80		T_{BP} = -40°C, V_D = 12Vdc, R_L = 50Ω
DC Gate Trigger Voltage	V_{GT}	–	–	2.5	Vdc	T_{BP} = 25°C, V_D = 12Vdc, R_L = 80Ω
		–	–	3.0		T_{BP} = -40°C, V_D = 12Vdc, R_L = 50Ω
		0.20	–	–		T_{BP} = 125°C, V_{DRM} = Rated, R_L = 1KΩ
Holding Current	I_H	–	–	75	mAdc	Anode Source Voltage = 24Vdc, Peak Initiating On-State Current = 0.5A, 0.1 msec to 10 msec Wide Pulse. Gate Trigger Source = 7V, 20 ohms. T_{BP} = 25°C.
		–	–	150		T_{BP} = -40°C.
Latching Current	I_L	–	–	150	mAdc	Main Terminal Source Voltage = 24Vdc, Gate trigger source = 15V, 100 ohms, 50μsec pulse width, 5μsec rise and fall times max. T_{BP} = 25°C.
		–	–	300		T_{BP} = -40°C.
Steady-State Thermal Resistance, Base Plate to Heat Sink	$R_{\Theta BP\text{-}HS}$	–	–	0.1	°C/Watt	NOTE: Assumes a 2.0 square inch surface area with thermal grease, GE-G-640, or equivalent on smooth contact surface.

PHASE CONTROL POWER MODULES

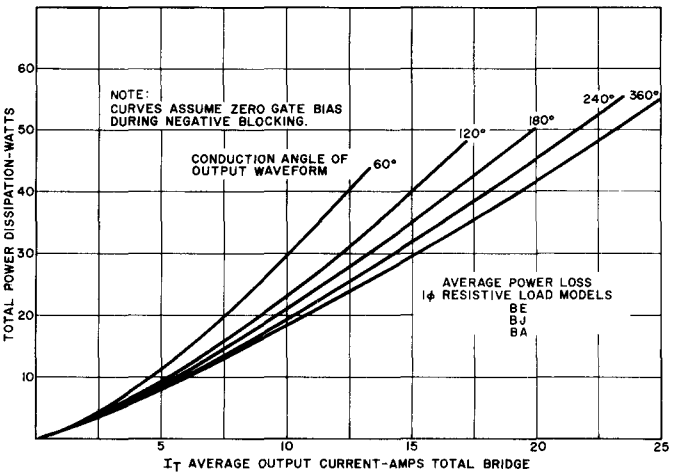
CIRCUIT FAMILY		BE		BJ		BA	
BASIC CIRCUIT SCHEMATIC							
AVERAGE OUTPUT CURRENT @ T_{BP} = 85°C AMPS		25		25		25	
VOLTAGE INPUT (V_{AC}) RMS		120	240	120	240	120	24
CIRCUIT* TYPES	BASIC CIRCUIT	WV2BE25C	WV2BE25E	WV2BJ25C	WV2BJ25E	WV2BA25C	WV2B
	WITHOUT FREE WHEELING DIODE	WV2BC25C	WV2BC25E	WV2BK25C	WV2BK25E		
	WITHOUT GE-MOV® VARISTOR PROTECTION	W2BE25C	W2BE25E	W2BJ25C	W2BJ25E	W2BA25C	W2B
	WITHOUT FREE WHEELING DIODE AND GE-MOV® VARISTOR PROTECTION	W2BC25C	W2BC25E	W2BK25C	W2BK25E		
TERMINAL POSITION							

*OTHER CIRCUIT TYPES AVAILABLE, CONTACT FACTORY.

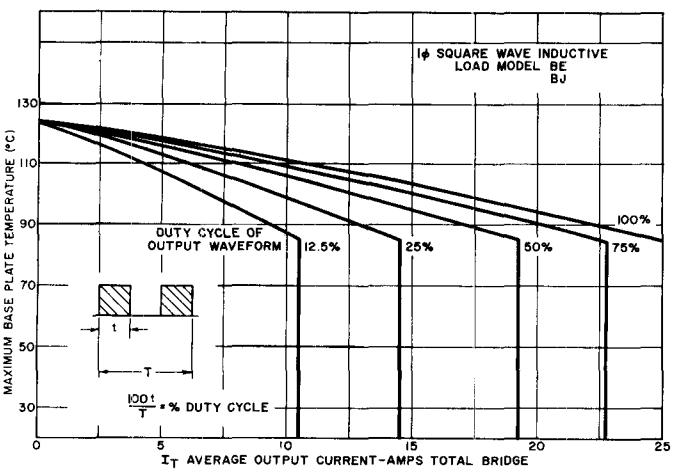
†CONTACT FACTORY FOR CURRENT RATINGS FOR APPLICABLE CIRCUIT.



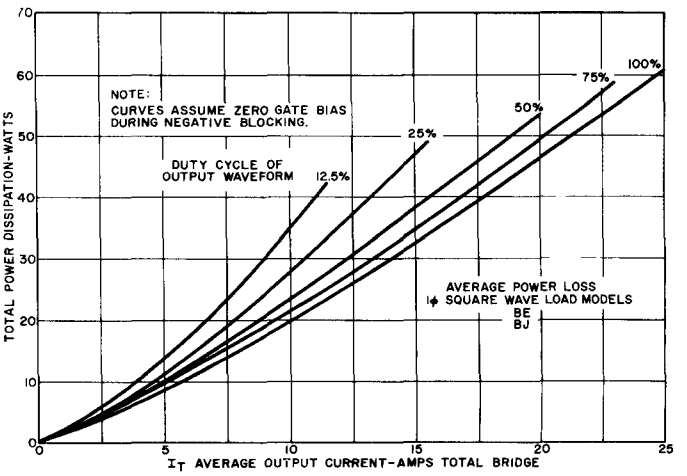
1. MAX. ALLOWABLE BASE PLATE TEMPERATURE VS. AVERAGE OUTPUT CURRENT (SINE WAVE)



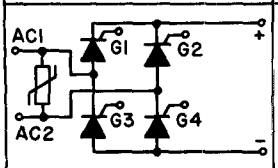
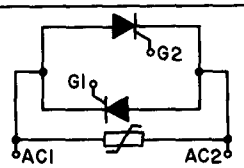
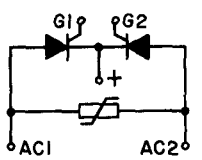
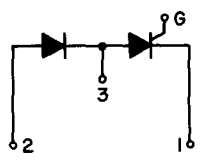
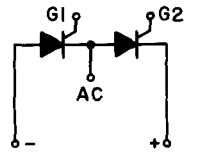
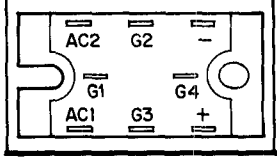
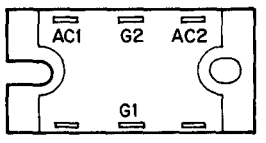
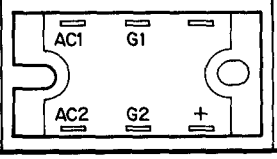
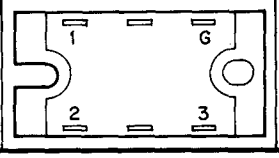
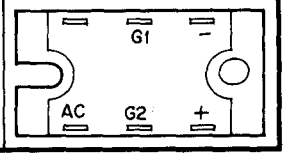
2. MAX. OUTPUT POWER DISSIPATION VS. AVERAGE OUTPUT CURRENT (SINE WAVE)

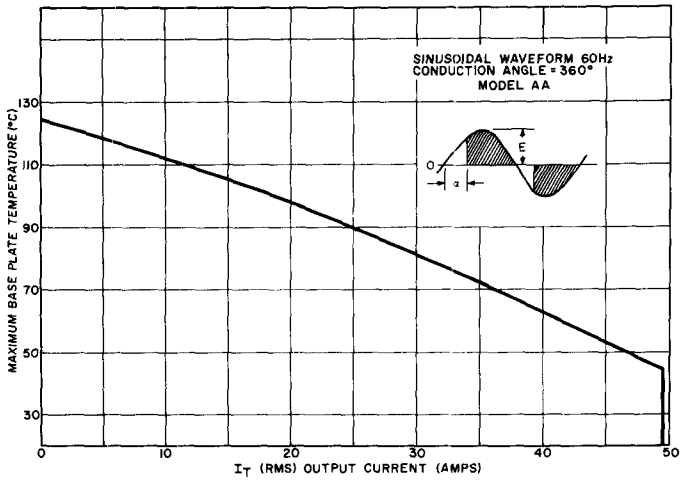


5. MAX. ALLOWABLE BASE PLATE TEMPERATURE VS. AVERAGE OUTPUT CURRENT (SQUARE WAVE)

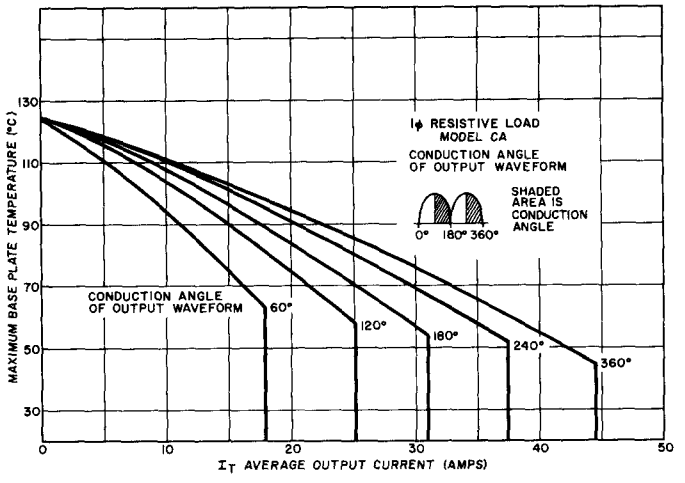


6. MAX. OUTPUT POWER DISSIPATION VS. AVERAGE OUTPUT CURRENT (SQUARE WAVE)

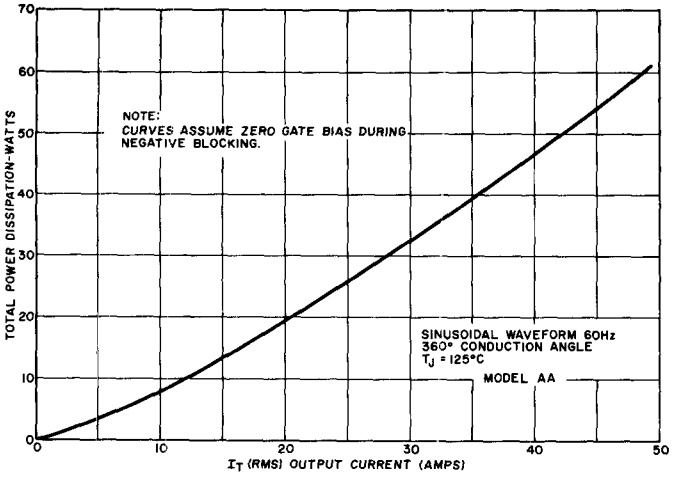
BH	AA	CA	DA	DC
				
25	50(ARMS)	25	†	†
120 / 240	120 / 240	120 / 240	120 / 240	120 / 240
WV2BH25C / WV2BH25E	WV2AA50C / WV2AA50E	WV2CA25C / WV2CA25E	WV2DA__C / WV2DA__E	WV2DC__C / WV2DC__E
W2BH25C / W2BH25E	W2AA50C / W2AA50E	W2CA25C / W2CA25E	W2DA__C / W2DA__E	W2DC__C / W2DC__E
				



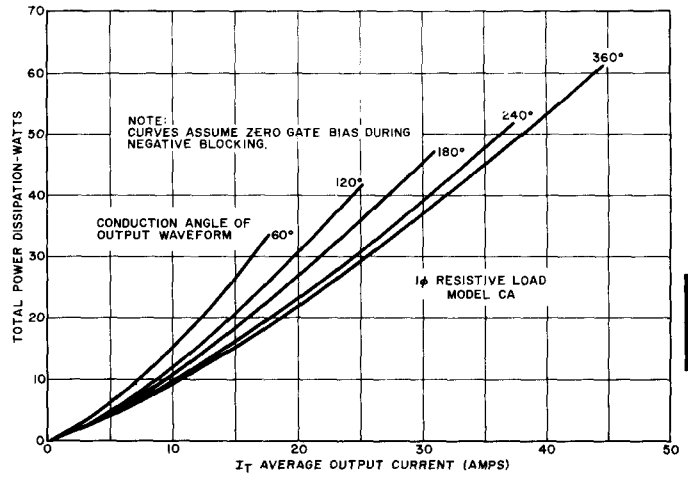
3. MAX. ALLOWABLE BASE PLATE TEMPERATURE VS. RMS OUTPUT CURRENT



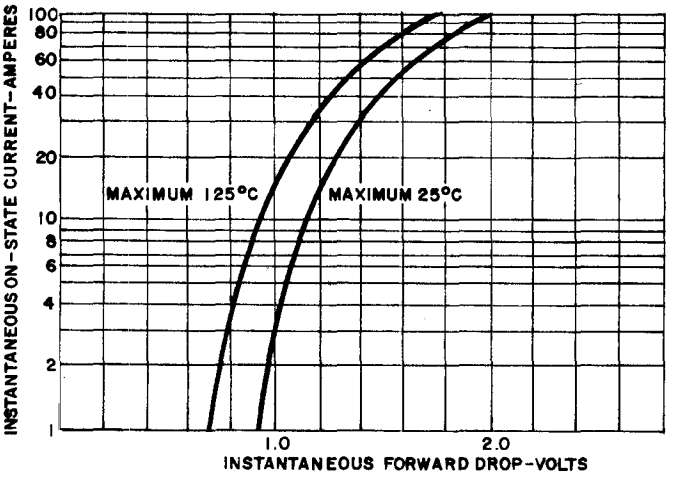
4. MAX. ALLOWABLE BASE PLATE TEMPERATURE VS. AVERAGE OUTPUT CURRENT (SINE WAVE)



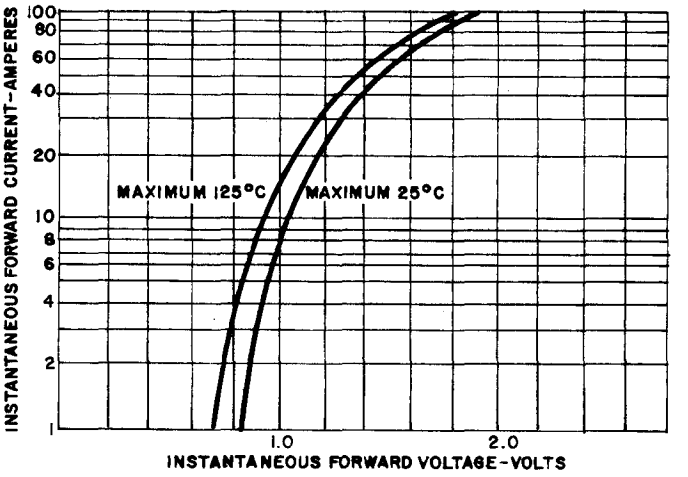
7. MAX. POWER DISSIPATION VS. RMS OUTPUT CURRENT



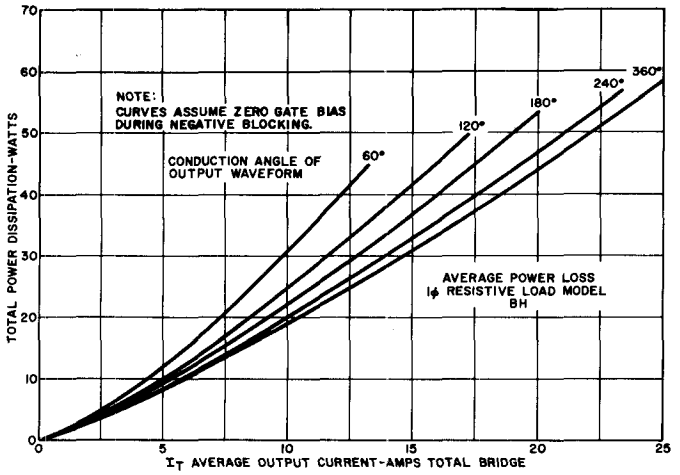
8. MAX. OUTPUT POWER DISSIPATION VS. AVERAGE OUTPUT CURRENT (SINE WAVE)



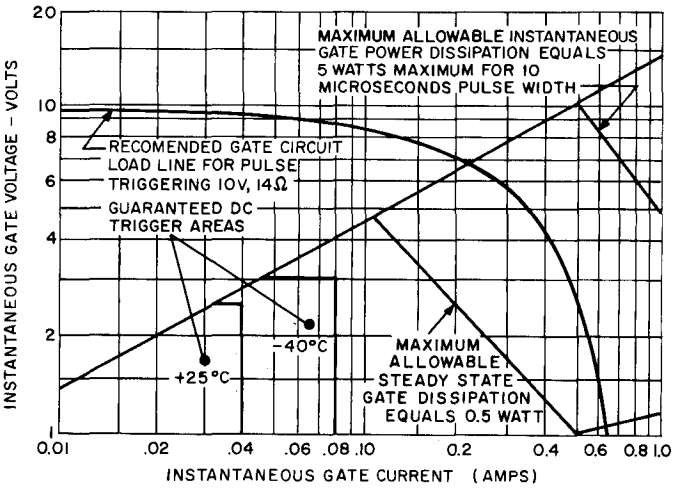
9. INSTANTANEOUS ON-STATE VOLTAGE VS. INSTANTANEOUS ON-STATE CURRENT (SCR)



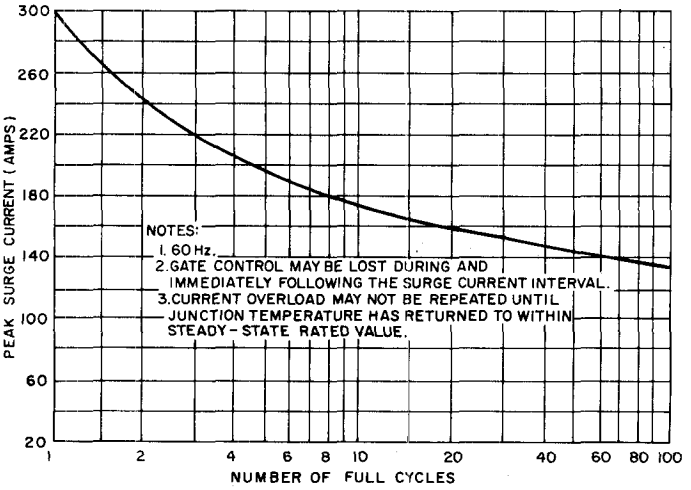
10. INSTANTANEOUS FORWARD VOLTAGE VS. INSTANTANEOUS FORWARD CURRENT (DIODE)



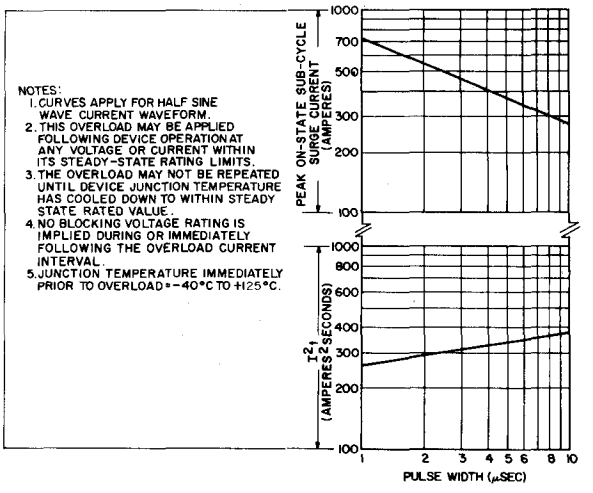
11. MAX. OUTPUT POWER DISSIPATION VS. AVERAGE OUTPUT CURRENT (SINE WAVE)



12. GATE TRIGGER CHARACTERISTICS



13. MAXIMUM ALLOWABLE SURGE CURRENT FOLLOWING RATED LOAD CONDITIONS



14. SUB-CYCLE SURGE AND I^2T RATING FOLLOWING RATED LOAD CONDITIONS