

# D<sup>2</sup>Pak SCR

(16 – 55 Amps)

## General Description

The Teccor Electronics line of thyristor SCR semi-conductors are half-wave, unidirectional, gate-controlled rectifiers which complement Teccor's line of sensitive SCRs. Teccor offers devices with ratings of 16-55 amps and 100 -1000 volts, with gate sensitivities from 30-40 milliamps. If gate currents in the 12-500 microamp ranges are required, please refer to Teccor's D-Pak sensitive SCR technical data sheets.


All SCRs have glass-passivated junctions to ensure long term reliability and parameter stability. Teccor's glass offers a reliable barrier against junction contamination

Embossed 24mm tape and reel packing or optional tube packing available.

## Features

- Glass-passivated junctions
- High voltage capability — 50 up to 1000 volts
- High surge capability — up to 650 amps
- Surface mount package
- Embossed 24mm tape and reel

# Electrical Specifications

TYPE	Part Number	$I_T$		$V_{DRM}$ & $V_{RRM}$	$I_{GT}$	$I_{DRM}$ & $I_{RRM}$			$V_{TM}$	$V_{GT}$		$I_H$	
	Non-Isolated	Maximum On-State Current (1)				Repetitive Peak Off-State Forward & Reverse Voltage	DC Gate Trigger Current $V_D = 12VDC$ $R_L = 60\Omega$ (3)	Peak Off-State Forward & Reverse Current at $V_{DRM}$ & $V_{RRM}$ (12)			Peak On-State Voltage at Max Rated RMS Current $T_C = 25^\circ C$ (2)		DC Gate-Trigger Voltage $V_D = 12VDC$ $R_L = 60\Omega$ (7)
	 D <sup>2</sup> Pak	Amps		Volts	mAmps			mAmps				Volts	Volts
		$I_{T(RMS)}$	$I_{T(AV)}$			$T_C = 25^\circ C$	$T_C = 100^\circ C$	$T_C = 125^\circ C$	MAX	$T_C = 25^\circ C$	$T_C = 125^\circ C$		MAX
		MAX	MAX	MIN	MIN	MAX	MAX	MAX	MAX	MAX	MIN	MAX	
16 A	S1016N	16	10	100	1	30	.01	0.5	1.0	1.6	1.5	0.2	40
	S2016N	16	10	200	1	30	.01	0.5	1.0	1.6	1.5	0.2	40
	S4016N	16	10	400	1	30	.01	0.5	1.0	1.6	1.5	0.2	40
	S6016N	16	10	600	1	30	.01	0.5	1.0	1.6	1.5	0.2	40
	**S8016N	16	10	800	1	30	.02	1.0	2.0	1.6	1.5	0.2	40
25 A	S1025N	25	16	100	1	35	.01	1.0	2.0	1.6	1.5	0.2	50
	S2025N	25	16	200	1	35	.01	1.0	2.0	1.6	1.5	0.2	50
	S4025N	25	16	400	1	35	.01	1.0	2.0	1.6	1.5	0.2	50
	S6025N	25	16	600	1	35	.01	1.0	2.0	1.6	1.5	0.2	50
	**S8025N	25	16	800	1	35	.02	1.5	3.0	1.6	1.5	0.2	50
40 A	S1040N	40	25	100	5	40	.01	1.0	2.0	1.8	1.5	0.2	60
	S2040N	40	25	200	5	40	.01	1.0	2.0	1.8	1.5	0.2	60
	S4040N	40	25	400	5	40	.01	1.0	2.0	1.8	1.5	0.2	60
	S6040N	40	25	600	5	40	.01	1.0	2.0	1.8	1.5	0.2	60
	**S8040N	40	25	800	5	40	.02	1.5	3.0	1.8	1.5	0.2	60
55 A	S1055N	55	35	100	5	40	.01	1.0	2.0	1.8	1.5	0.2	60
	S2055N	55	35	200	5	40	.01	1.0	2.0	1.8	1.5	0.2	60
	S4055N	55	35	400	5	40	.01	1.0	2.0	1.8	1.5	0.2	60
	S6055N	55	35	600	5	40	.01	1.0	2.0	1.8	1.5	0.2	60
	**S8055N	55	35	800	5	40	.02	1.5	3.0	1.8	1.5	0.2	60

\*\* Consult factory for 1000 volt device

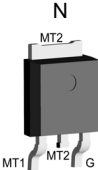
## General Notes

- All measurements are made at 60Hz with a resistive load at an ambient temperature of +25°C unless otherwise specified.
- Operating temperature range ( $T_J$ ) is -40°C to +125°C
- Storage temperature range ( $T_S$ ) is -40°C to +150°C
- Lead solder temperature is a maximum of 230°C for 10 seconds maximum; 1/16" (1.59mm) from case.
- The case temperature ( $T_C$ ) is measured as shown on dimensional outline drawings. See "Package Dimensions" section of this catalog.

## Electrical Specification Notes

- See Figures 1.2 through 1.9 for current rating at specified operating case temperature.
- See Figures 1.12 and 1.13 for instantaneous on-state current vs on-state voltage (typical).
- See Figure 1.11 for  $I_{GT}$  vs  $T_C$ .
- See Figure 1.10 for  $I_H$  vs  $T_C$ .
- For more than one full cycle rating, see Figure 1.18.
- See Figure 1.15 for  $t_{gt}$  vs  $I_{GT}$ .
- See Figure 1.14 for  $V_{GT}$  vs  $T_C$ .
- Test conditions are as follows: 2A .Pulse duration = 50µs, dv/dt = 20V/µs, di/dt = -30A/µs  $I_{GT} = 200mA$  at turn-on.
- See Figures 1.2 through 1.5 for maximum allowable case temperatures at maximum rated current.
- Pulse width ≤ 10µs.
- Initial on-state current = 200mA(DC) for 16A devices; 400mA(DC) for 25A through 55A devices.
- $T_C = T_J$  for test conditions in off-state.

I <sub>GM</sub>	P <sub>GM</sub>	P <sub>G(AV)</sub>	I <sub>TSM</sub>		dv/dt		I <sup>2</sup> t	di/dt	t <sub>gt</sub>	t <sub>q</sub>
			Amps		Volts/μS					
Peak Gate Current (10)	Peak Gate Power Dissipation (10)	Average Gate Power Dissipation	Peak One Cycle Surge Forward Current (5) (9)		Critical Rate of Applied Forward Voltage		RMS Surge (Non-Repetitive) On-State Current for a Period of 8.3 ms for Fusing	Maximum Rate-of-Rise of On-State Current I <sub>GT</sub> = 150mA with 0.1μs Rise Time	Gate Controlled Turn-On Time Gate Pulse = 100mA Minimum Width=15μS with Rise Time ≤ 0.1μS (6)	Circuit Commutated Turn-Off Time (8) (9)
Amps	Watts	Watts	60Hz	50Hz	T <sub>C</sub> = 100°C	T <sub>C</sub> = 125°C	Amps <sup>2</sup> Sec	Amps/μSec	μSec	μSec
					MIN	MIN			TYP	MAX
3.0	30	0.6	225	188	450	350	210	125	2.0	35
3.0	30	0.6	225	188	450	350	210	125	2.0	35
3.0	30	0.6	225	188	450	350	210	125	2.0	35
3.0	30	0.6	225	188	425	325	210	125	2.0	35
3.0	30	0.6	225	188	400	300	210	125	2.0	35
3.5	35	0.8	350	300	450	350	510	150	2.0	35
3.5	35	0.8	350	300	450	350	510	150	2.0	35
3.5	35	0.8	350	300	450	350	510	150	2.0	35
3.5	35	0.8	350	300	425	325	510	150	2.0	35
3.5	35	0.8	350	300	400	300	510	150	2.0	35
3.5	35	0.8	520	440	650	550	1122	175	2.5	35
3.5	35	0.8	520	440	650	550	1122	175	2.5	35
3.5	35	0.8	520	440	650	550	1122	175	2.5	35
3.5	35	0.8	520	440	600	500	1122	175	2.5	35
3.5	35	0.8	520	440	500	475	1122	175	2.5	35
4.0	40	0.8	650	550	650	550	1750	175	2.5	35
4.0	40	0.8	650	550	650	550	1750	175	2.5	35
4.0	40	0.8	650	550	650	550	1750	175	2.5	35
4.0	40	0.8	650	550	600	500	1750	175	2.5	35
4.0	40	0.8	650	550	500	475	1750	175	2.5	35

THERMAL RESISTANCE (Steady State) R <sub>θJC</sub> [R <sub>θJA</sub> ] (TYP.) °C/W	
Type	 <p>D<sup>2</sup>Pak</p>
16 amps	1.5
25 amps	1.1
40 amps	0.66
55 amps	0.58

# Electrical Specifications

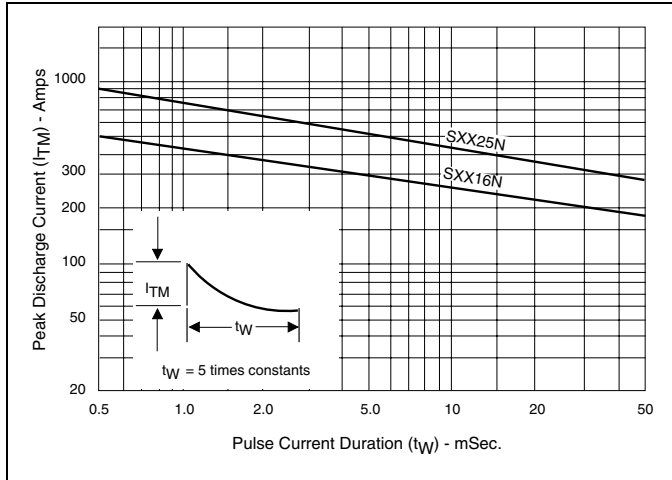


Figure 1.0 Peak Capacitor Discharge Current(16 and 25 amp)

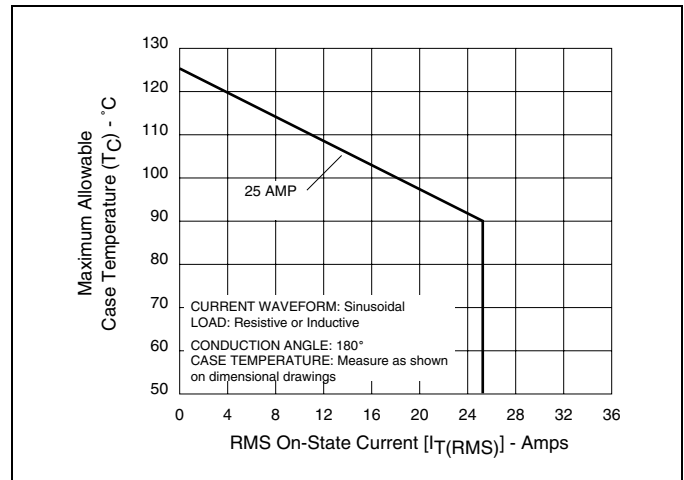


Figure 1.3 Maximum Allowable Case Temperature vs RMS On-State Current (25 amps)

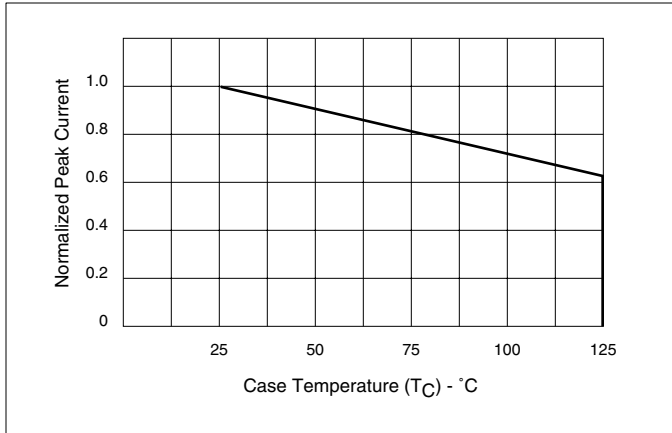


Figure 1.1 Peak Capacitor Discharge Current Derating for Maximum Allowable Case Temperature (16 and 25 amp)

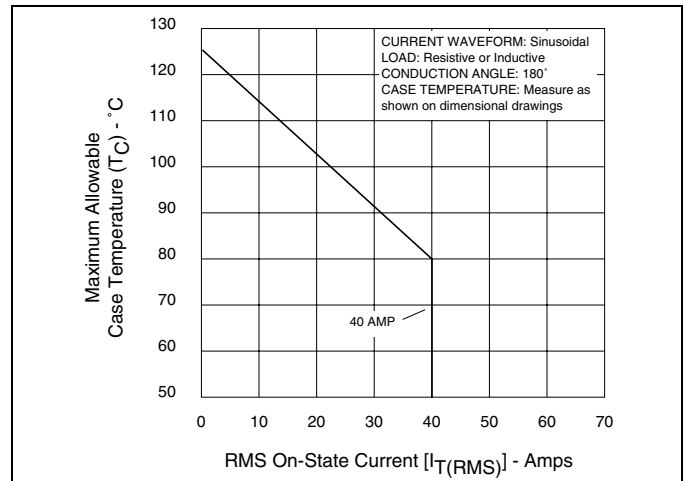


Figure 1.4 Maximum Allowable Case Temperature vs RMS On-State Current (40 amps)

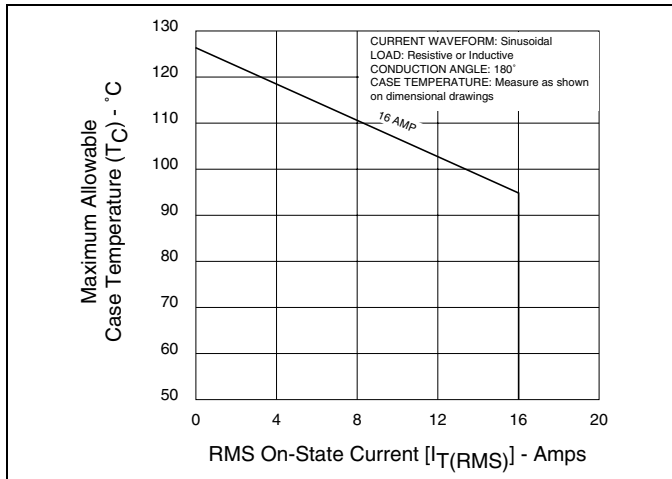


Figure 1.2 Maximum Allowable Case Temperature vs RMS On-State Current (16 amps)

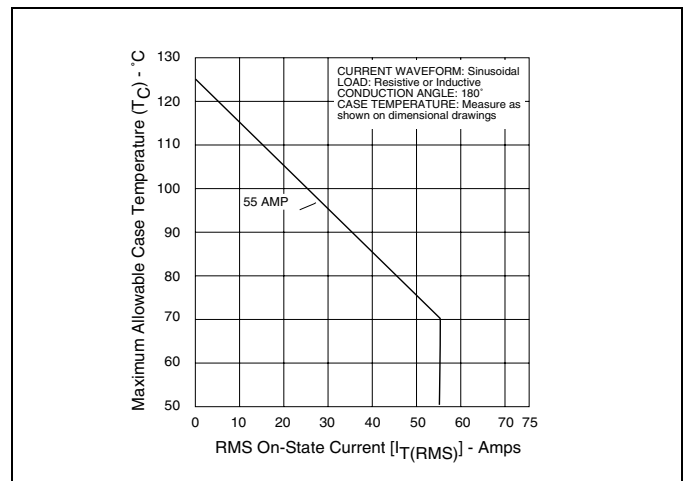


Figure 1.5 Maximum Allowable Case Temperature vs RMS On-State Current (55 Amps)

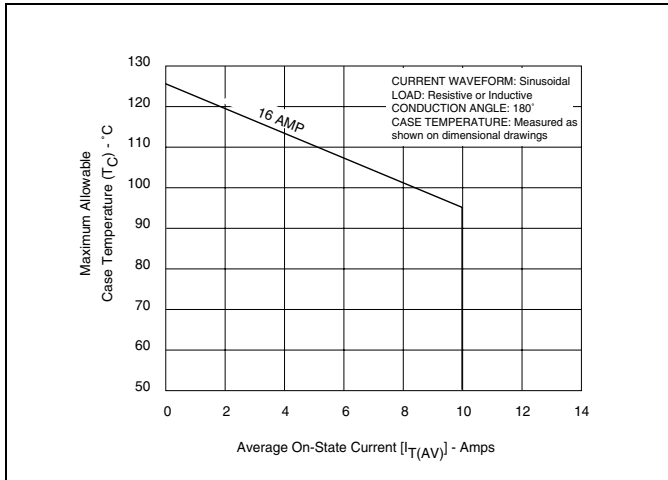


Figure 1.6 Maximum Allowable Case Temperature vs Average On-State Current (16 Amps)

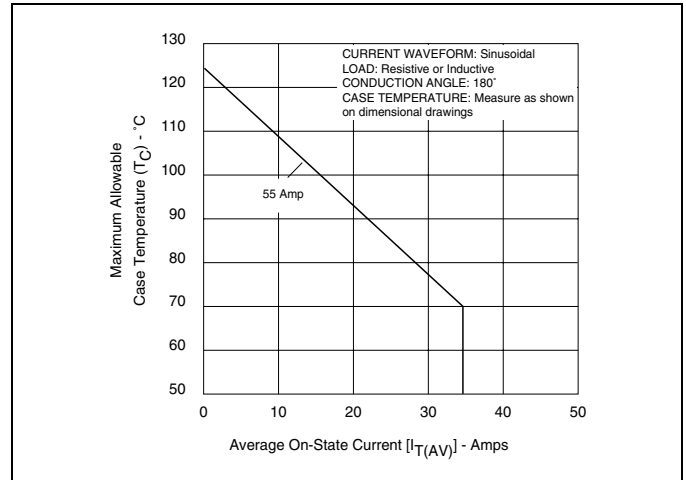


Figure 1.9 Maximum Allowable Case Temperature vs Average On-State Current (55 Amps)

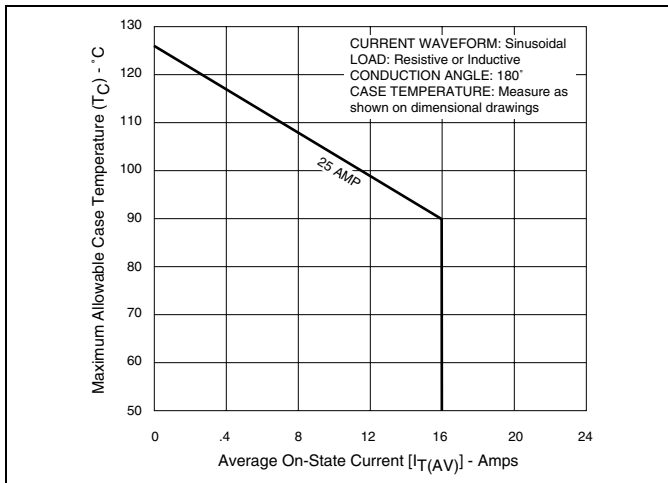


Figure 1.7 Maximum Allowable Case Temperature vs Average On-State Current (25 Amps)

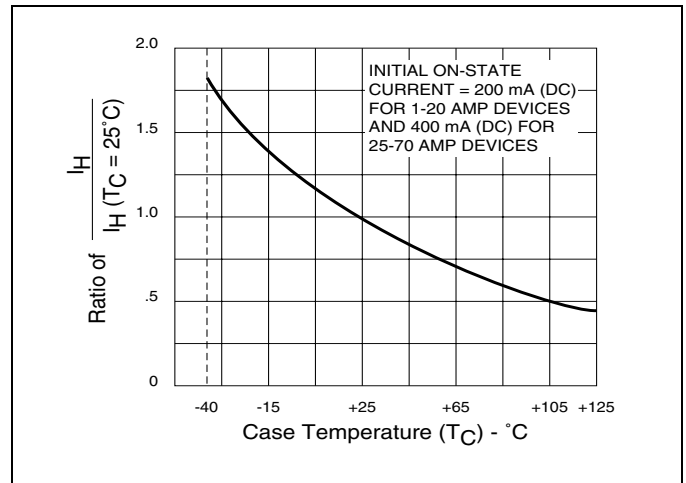


Figure 1.10 Normalized DC Holding Current vs Case Temperature

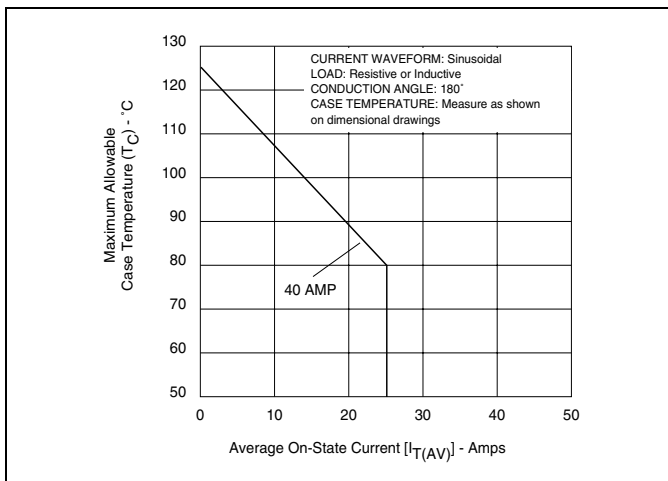


Figure 1.8 Maximum Allowable Case Temperature vs Average On-State Current (40 Amps)

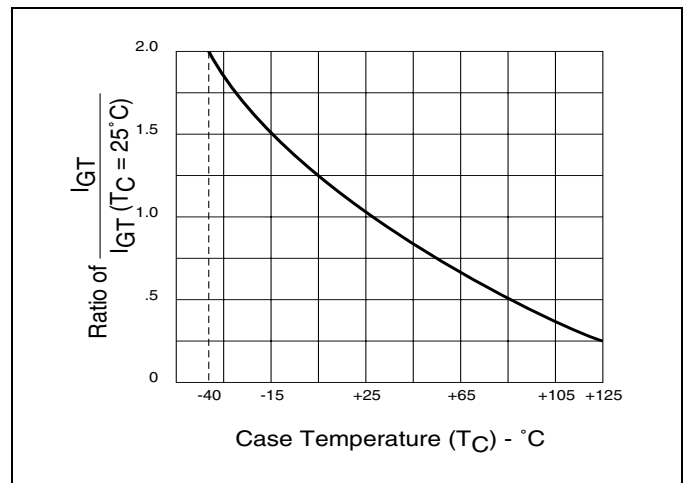


Figure 1.11 Normalized DC Gate-Trigger Current vs Case Temperature

# Electrical Specifications

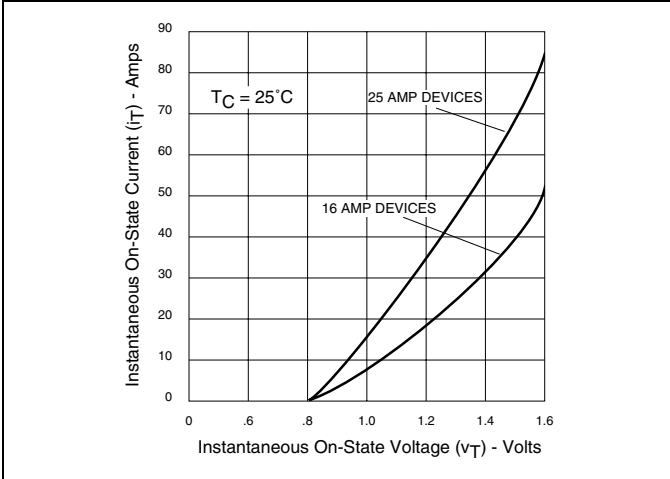


Figure 1.12 Instantaneous On-State Current vs On-State Voltage (Typical) (16-25 Amps)

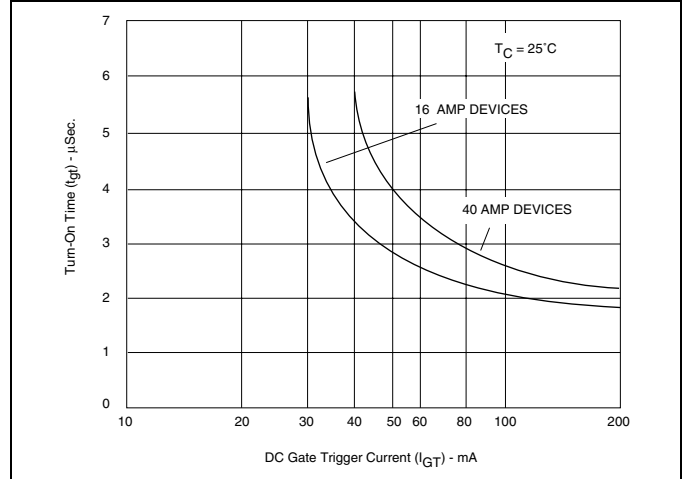


Figure 1.15 Typical Turn-On Time vs Gate-Trigger Current (16-40 Amp)

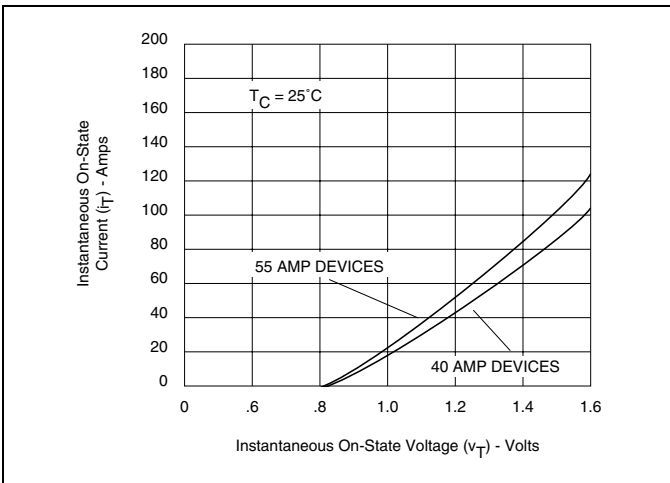


Figure 1.13 Instantaneous On-State Current vs On-State Voltage (Typical) (40-55 Amps)

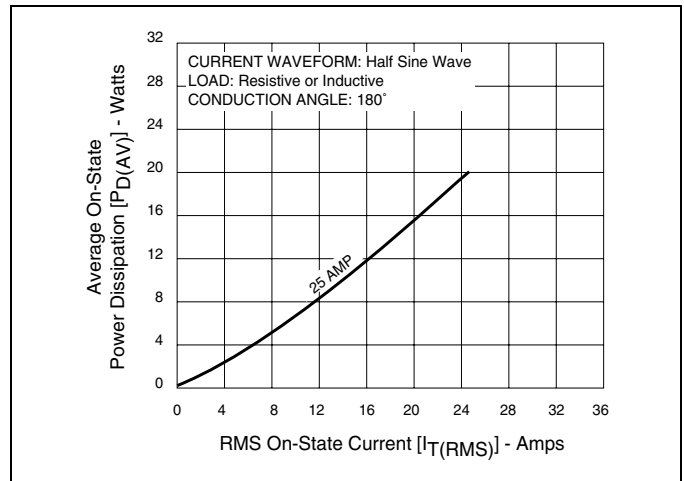


Figure 1.16 Power Dissipation (Typical) vs RMS On-State Current (25 Amps)

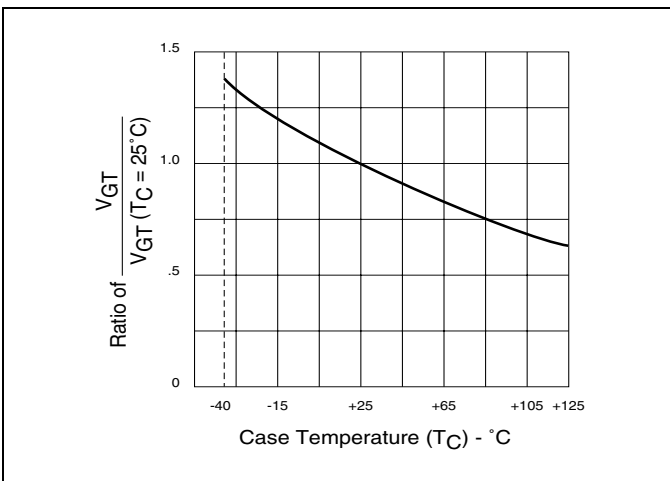


Figure 1.14 Normalized DC Gate-Trigger Voltage vs Case Temperature

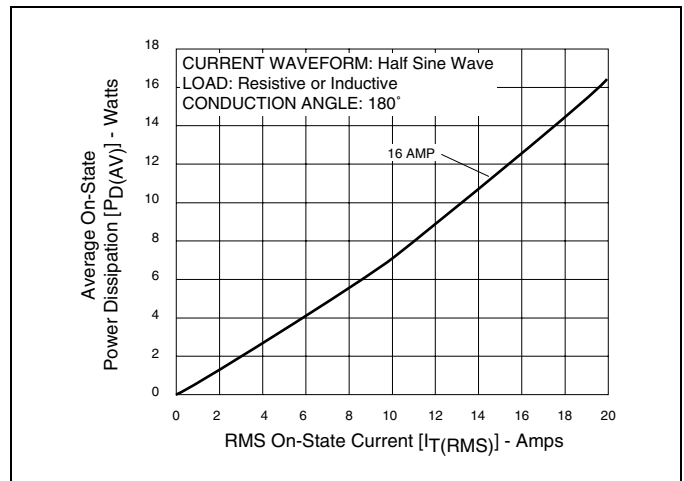


Figure 1.17 Power Dissipation (Typical) vs RMS On-State Current (16 Amps)

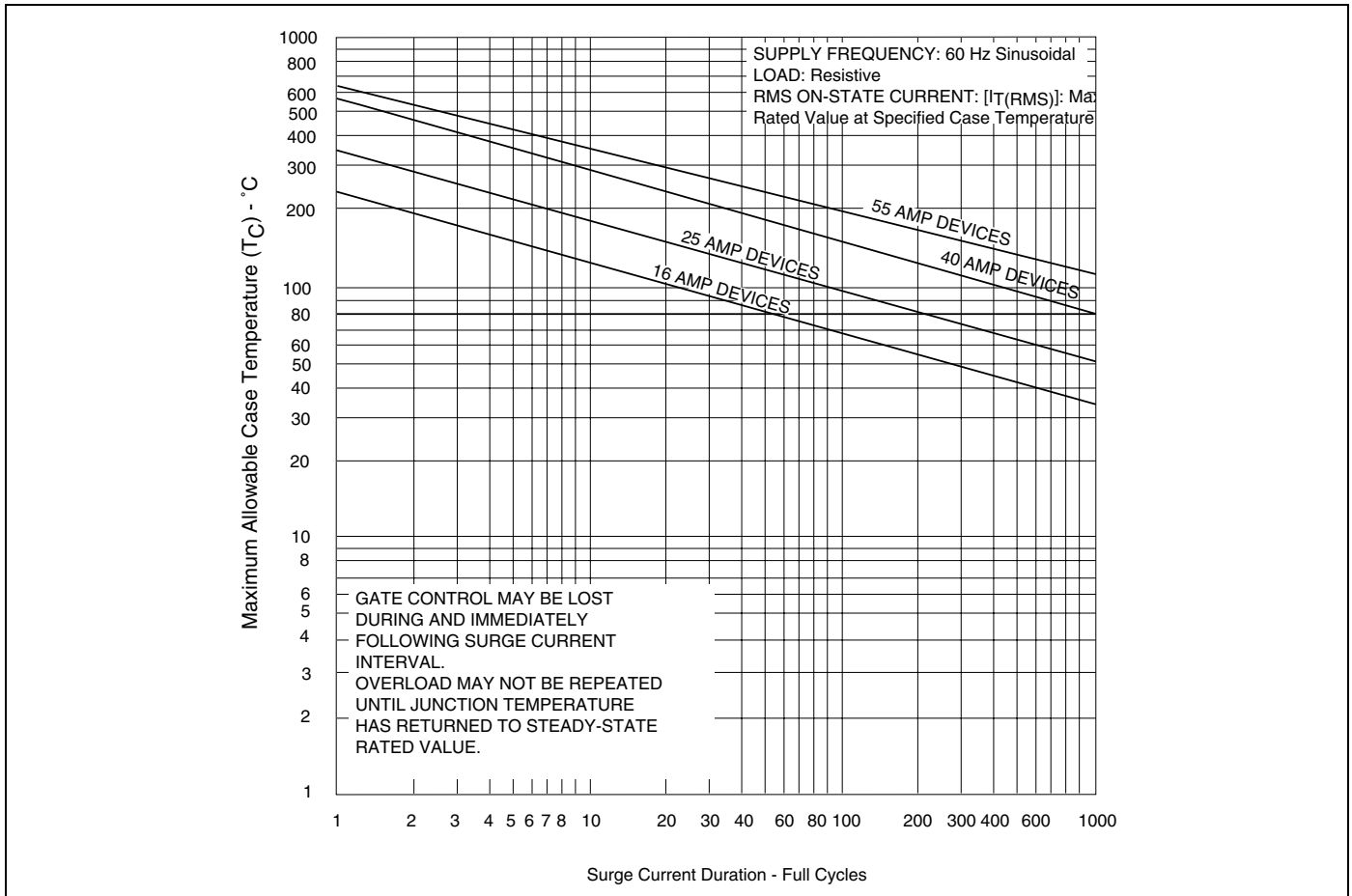


Figure 1.18 Peak Surge Current vs Surge Current Duration

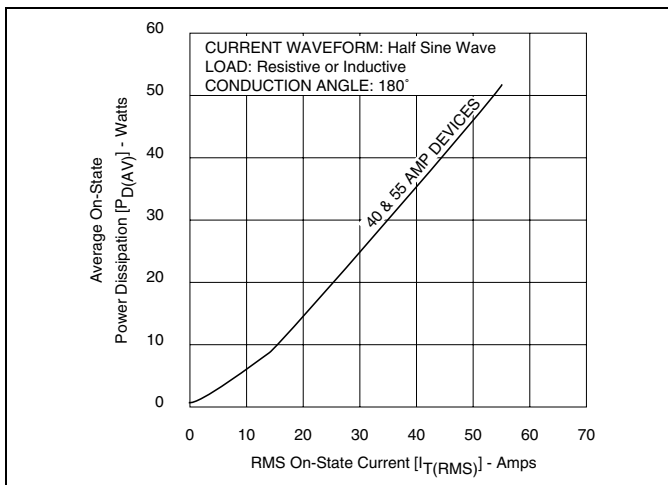
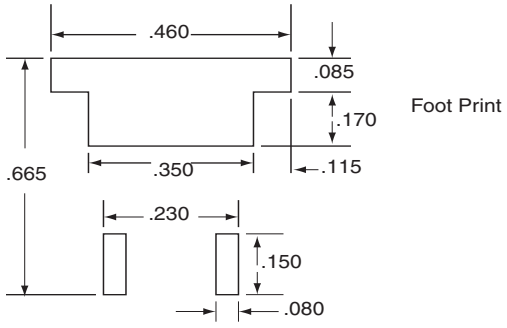
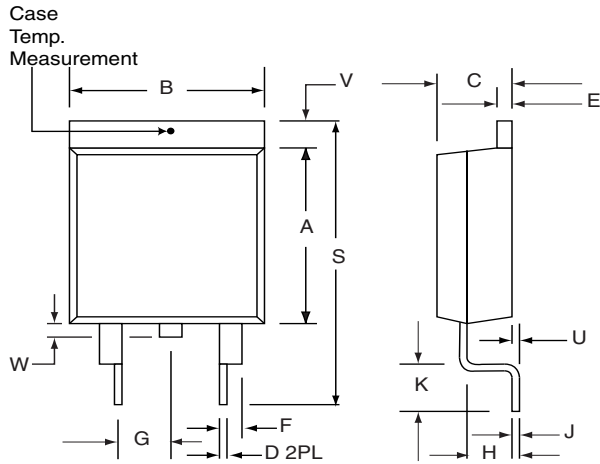


Figure 1.19 Power Dissipation (typical) vs RMS On-State Current (40-55 Amp)

# Package Dimensions



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.360	.370	9.14	9.40
B	.380	.420	9.65	10.67
C	.178	.188	4.52	4.78
D	.025	.035	0.63	0.89
E	.048	.055	1.22	1.40
F	.060	.075	1.52	1.91
G	.095	.105	2.41	2.67
H	.083	.093	2.11	2.36
J	.018	.024	0.46	0.61
K	.090	.110	2.29	2.79
S	.590	.625	14.99	15.87
V	.035	.045	0.89	1.14
U	.002	.010	0.05	0.25
W	.040	.070	1.02	1.78