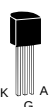
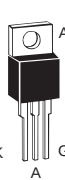
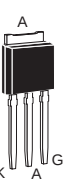
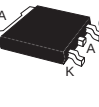


TYPE	Part Number							I _T		V _{DRM} & V _{RRM}		I _{GT}	
	 TO-92	Isolated	Non-isolated										
		 TO-220	 TO-202	 TO-220	 TO-251 V-Pak	 Compak	 TO-252 D-Pak						
		(1) (2) (15)						Amps		Volts		mAmps	
		See "Package Dimensions" section for variations. (11)						I _{T(RMS)} MAX	I _{T(AV)} MAX	MIN	MIN	MAX	
1 A	S201E					S2N1		1	0.64	200	1	10	
	S401E					S4N1		1	0.64	400	1	10	
	S601E					S6N1		1	0.64	600	1	10	
6 A		S2006L	S2006F1		S2006V		S2006D	6	3.8	200	1	15	
		S4006L	S4006F1		S4006V		S4006D	6	3.8	400	1	15	
		S6006L	S6006F1		S6006V		S6006D	6	3.8	600	1	15	
		S8006L			S8006V		S8006D	6	3.8	800	1	15	
		SK006L			SK006V		SK006D	6	3.8	1000	1	15	
8 A		S2008L	S2008F1	S2008R	S2008V		S2008D	8	5.1	200	1	15	
		S4008L	S4008F1	S4008R	S4008V		S4008D	8	5.1	400	1	15	
		S6008L	S6008F1	S6008R	S6008V		S6008D	8	5.1	600	1	15	
		S8008L		S8008R	S8008V		S8008D	8	5.1	800	1	15	
		SK008L		SK008R	SK008V		SK008D	8	5.1	1000	1	15	
10 A		S2010L	S2010F1	S2010R	S2010V		S2010D	10	6.4	200	1	15	
		S4010L	S4010F1	S4010R	S4010V		S4010D	10	6.4	400	1	15	
		S6010L	S6010F1	S6010R	S6010V		S6010D	10	6.4	600	1	15	
		S8010L		S8010R	S8010V		S8010D	10	6.4	800	1	15	
		SK010L		SK010R	SK010V		SK010D	10	6.4	1000	1	15	
12 A				S2012R	S2012V		S2012D	12	7.6	200	1	20	
				S4012R	S4012V		S4012D	12	7.6	400	1	20	
				S6012R	S6012V		S6012D	12	7.6	600	1	20	
				S8012R	S8012V		S8012D	12	7.6	800	1	20	
				SK012R	SK012V		SK012D	12	7.6	1000	1	20	

Specific Test Conditions

di/dt — Maximum rate-of-rise of on-state current; $I_{GT} = 150$ mA with ≤ 0.1 μ s rise time

dv/dt — Critical rate of applied forward voltage

I^2t — RMS surge (non-repetitive) on-state current for period of 8.3 ms for fusing

I_{DRM} and I_{RRM} — Peak off-state forward and reverse current at V_{DRM} and V_{RRM}

I_{gt} — dc gate trigger current; $V_D = 12$ V dc; $R_L = 60$ Ω for 1 to 16 A devices and 30 Ω for 20 to 70 A devices

I_{GM} — Peak gate current

I_H — dc holding current; gate open

I_T — Maximum on-state current

I_{TSM} — Peak one-cycle forward surge current

$P_{G(AV)}$ — Average gate power dissipation

P_{GM} — Peak gate power dissipation

t_{gt} — Gate controlled turn-on time; gate pulse = 100 mA; minimum width = 15 μ s with rise time ≤ 0.1 μ s

t_q — Circuit commutated turn-off time

V_{DRM} and V_{RRM} — Repetitive peak off-state forward and reverse voltage

V_{gt} — DC gate trigger voltage; $V_D = 12$ V dc; $R_L = 60$ Ω for 1 to 16 A devices and 30 Ω for 20 to 70 A devices

V_{TM} — Peak on-state voltage at maximum rated RMS current

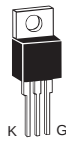
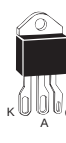
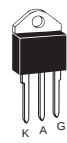
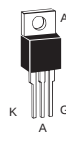
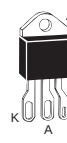
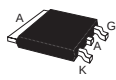
General Notes

- All measurements are made at 60 Hz with a resistive load at an ambient temperature of +25 °C unless otherwise specified.
- Operating temperature range (T_J) is -65 °C to +125 °C for TO-92 devices and -40 °C to +125 °C for all other packages.
- Storage temperature range (T_S) is -65 °C to +150 °C for TO-92 devices, -40 °C to +150 °C for TO-202 and TO-220 devices, and -40 °C to +125 °C for all others.
- Lead solder temperature is a maximum of 230 °C for 10 seconds maximum; $\geq 1/16"$ (1.59 mm) from case.
- The case temperature (T_C) is measured as shown on dimensional outline drawings in the "Package Dimensions" section of this catalog.

I _{DRM} & I _{RRM}			V _{TM}	V _{GT}	I _H	I _{GM}	P _{GM}	P _{G(AV)}	I _{TSM}	dv/dt		I ² t	di/dt	t _{gt}	t _q
(14)			(3)	(8) (17)	(5) (13)	(12)	(12)		(6) (10)					(7)	(9) (10)
mAmps			Volts	Volts					Amps	Volts/μSec					
T _C = 25 °C	T _C = 100 °C	T _C = 125 °C	T _C = 25 °C	T _C = 25 °C	mAmps	Amps	Watts	Watts	60/50 Hz	T _C = 100 °C	T _C = 125 °C	Amps ² Sec	Amps/μSec	μSec	μSec
MAX			MAX	MAX	MAX					MIN	MIN			TYP	MAX
0.01	0.2	0.5	1.6	1.5	30	1.5	15	0.3	30/25	40	20	3.7	50	2	35
0.01	0.2	0.5	1.6	1.5	30	1.5	15	0.3	30/25	40	20	3.7	50	2	35
0.01	0.2	0.5	1.6	1.5	30	1.5	15	0.3	30/25	40	20	3.7	50	2	35
0.01	0.2	0.5	1.6	1.5	30	2	20	0.5	100/83	350	250	41	100	2	35
0.01	0.2	0.5	1.6	1.5	30	2	20	0.5	100/83	350	250	41	100	2	35
0.01	0.2	0.5	1.6	1.5	30	2	20	0.5	100/83	300	225	41	100	2	35
0.01	0.2	0.5	1.6	1.5	30	2	20	0.5	100/83	250	200	41	100	2	35
0.02	3		1.6	1.5	30	2	20	0.5	100/83	100		41	100	2	35
0.01	0.2	0.5	1.6	1.5	30	2	20	0.5	100/83	350	250	41	100	2	35
0.01	0.2	0.5	1.6	1.5	30	2	20	0.5	100/83	350	250	41	100	2	35
0.01	0.2	0.5	1.6	1.5	30	2	20	0.5	100/83	300	225	41	100	2	35
0.01	0.2	0.5	1.6	1.5	30	2	20	0.5	100/83	250	200	41	100	2	35
0.02	3		1.6	1.5	30	2	20	0.5	100/83	100		41	100	2	35
0.01	0.2	0.5	1.6	1.5	30	2	20	0.5	100/83	350	250	41	100	2	35
0.01	0.2	0.5	1.6	1.5	30	2	20	0.5	100/83	350	250	41	100	2	35
0.01	0.2	0.5	1.6	1.5	30	2	20	0.5	100/83	300	225	41	100	2	35
0.02	0.5	1	1.6	1.5	30	2	20	0.5	100/83	250	200	41	100	2	35
0.02	3		1.6	1.5	30	2	20	0.5	100/83	100		41	100	2	35
0.01	0.5	1	1.6	1.5	40	2	20	0.5	120/100	350	250	60	100	2	35
0.01	0.5	1	1.6	1.5	40	2	20	0.5	120/100	350	250	60	100	2	35
0.01	0.5	1	1.6	1.5	40	2	20	0.5	120/100	300	225	60	100	2	35
0.02	0.5	1	1.6	1.5	40	2	20	0.5	120/100	250	200	60	100	2	35
0.02	3		1.6	1.5	40	2	20	0.5	120/100	100		60	100	2	35

Electrical Specification Notes

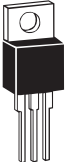
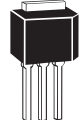
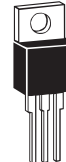
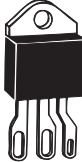
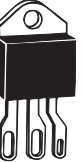
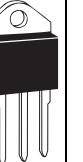
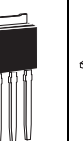
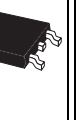
- (1) See Figure E6.5 through Figure E6.16 for current rating at specified operating case temperature.
- (2) See Figure E6.1 and Figure E6.2 for free air current rating.
- (3) See Figure E6.19 and Figure E6.20 for instantaneous on-state current versus on-state voltage (typical).
- (4) See Figure E6.18 for I_{GT} versus T_C.
- (5) See Figure E6.17 for I_H versus T_C.
- (6) For more than one full cycle rating, see Figure E6.23.
- (7) See Figure E6.22 for t_{gt} versus I_{GT}.
- (8) See Figure E6.21 for V_{GT} versus T_C.
- (9) Test conditions are as follows:
 - I_T = 1 A for 1 A devices and 2 A for all other devices
 - Pulse duration = 50 μs, dv/dt = 20 V/μs, di/dt = -10 A/μs for 1 A devices, and -30 A/μs for other devices
 - I_{GT} = 200 mA at turn-on
- (10) See Figure E6.5 through Figure E6.10 for maximum allowable case temperatures at maximum rated current.
- (11) See package outlines for lead form configuration. When ordering special lead forming, add type number as suffix to part number.
- (12) Pulse width ≤ 10 μs
- (13) Initial on-state current = 200 mA dc for 1 A through 16 A devices; 400 mA dc for 20 A through 70 A devices.
- (14) T_C = T_J for test conditions in off state.
- (15) The R, K, or M package rating is intended for high surge condition use only and not recommended for ≥ 50 A rms continuous current use since narrow pin lead temperature can exceed PCB solder melting temperature. Teccor's J package or W package is recommended for ≥ 50 A rms continuous current requirements.
- (16) For various durations of an exponentially decaying current waveform, see Figure E6.3 and Figure E6.4. (t_W is defined as 5 time constants.)
- (17) Minimum non-trigger V_{GT} at 125 °C is 0.2 V.

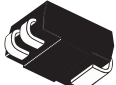
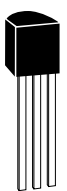
TYPE	Part Number						I _T		V _{DRM} & V _{R_{RRM}}	I _{GT}		I _{DRM} & I _{R_{RRM}}			
	Isolated			Non-isolated											
								(1) (15)		Volts	(4)	(14)			
	TO-220	TO-218X	TO-218	TO-220	TO-218X	TO-218	TO-263 D ² Pak	Amps				mAmps			
	See "Package Dimensions" section for variations. (11)							I _{T(RMS)}	I _{T(AV)}				T _C = 25 °C	T _C = 100 °C	T _C = 125 °C
							MAX		MIN	MIN	MAX	MAX			
15 A	S2015L						15	9.5	200	1	30	0.01	0.5	1	
	S4015L						15	9.5	400	1	30	0.01	0.5	1	
	S6015L						15	9.5	600	1	30	0.01	0.5	1	
	S8015L						15	9.5	800	1	30	0.02	1	2	
	SK015L						15	9.5	1000	1	30	0.02	3		
16 A				S2016R		S2016N	16	10	200	1	30	0.01	0.5	1	
				S4016R		S4016N	16	10	400	1	30	0.01	0.5	1	
				S6016R		S6016N	16	10	600	1	30	0.01	0.5	1	
				S8016R		S8016N	16	10	800	1	30	0.02	1	2	
				SK016R		SK016N	16	10	1000	1	30	0.02	3		
20 A	S2020L						20	12.8	200	1	30	0.01	0.5	1	
	S4020L						20	12.8	400	1	30	0.01	0.5	1	
	S6020L						20	12.8	600	1	30	0.01	0.5	1	
	S8020L						20	12.8	800	1	30	0.02	1.0	2	
	SK020L						20	12.8	1000	1	30	0.02	3		
25 A	S2025L			S2025R		S2025N	25	16	200	1	35	0.01	1	2	
	S4025L			S4025R		S4025N	25	16	400	1	35	0.01	1	2	
	S6025L			S6025R		S6025N	25	16	600	1	35	0.01	1	2	
	S8025L			S8025R		S8025N	25	16	800	1	35	0.02	1.5	3	
	SK025L			SK025R		SK025N	25	16	1000	1	35	0.02	3		
35 A		S2035J	S2035K				35	22	200	5	40	0.01	1	2	
		S4035J	S4035K				35	22	400	5	40	0.01	1	2	
		S6035J	S6035K				35	22	600	5	40	0.01	1	2	
		S8035J	S8035K				35	22	800	5	40	0.02	1.5	3	
			SK035K				35	22	1000	5	40	0.02	3		
40 A				S2040R		S2040N	40	25	200	5	40	0.01	1	2	
				S4040R		S4040N	40	25	400	5	40	0.01	1	2	
				S6040R		S6040N	40	25	600	5	40	0.01	1	2	
				S8040R		S8040N	40	25	800	5	40	0.02	1.5	3	
				SK040R		SK040N	40	25	1000	5	40	0.03	5		
55 A				S2055R	S2055W	S2055M	S2055N	55	35	200	5	40	0.01	1	2
				S4055R	S4055W	S4055M	S4055N	55	35	400	5	40	0.01	1	2
				S6055R	S6055W	S6055M	S6055N	55	35	600	5	40	0.01	1	2
				S8055R	S8055W	S8055M	S8055N	55	35	800	5	40	0.02	1.5	3
				SK055R		SK055M	SK055N	55	35	1000	5	40	0.03	5	
65 A		S2065J	S2065K				65	41	200	5	50	0.02	1.5	3	
		S4065J	S4065K				65	41	400	5	50	0.02	1.5	3	
		S6065J	S6065K				65	41	600	5	50	0.02	1.5	3	
		S8065J	S8065K				65	41	800	5	50	0.02	2	5	
			SK065K				65	41	1000	5	50	0.03	5		
70 A					S2070W		70	45	200	5	50	0.02	1.5	3	
					S4070W		70	45	400	5	50	0.02	1.5	3	
					S6070W		70	45	600	5	50	0.02	1.5	3	
					S8070W		70	45	800	5	50	0.02	2	5	

See "General Notes" on page E6 - 2 and "Electrical Specification Notes" on page E6 - 3.

V _{TM}	V _{GT}	I _H	I _{GM}	P _{GM}	P _{G(AV)}	I _{TSM}	dv/dt		I ² t	di/dt	t _{gt}	t _q
(3)	(8) (17)	(5) (13)	(12)	(12)		(6) (10) (16)					(7)	(9) (10)
Volts	Volts					Amps	Volts/μSec					
T _C = 25 °C	T _C = 25 °C	mAmps	Amps	Watts	Watts	60/50 Hz	T _C = 100 °C	T _C = 125 °C	Amps ² Sec	Amps/μSec	μSec	μSec
MAX	MAX	MAX					MIN	MIN			TYP	MAX
1.6	1.5	40	3	30	0.6	225/188	450	350	210	125	2	35
1.6	1.5	40	3	30	0.6	225/188	450	350	210	125	2	35
1.6	1.5	40	3	30	0.6	225/188	425	325	210	125	2	35
1.6	1.5	40	3	30	0.6	225/188	400	300	210	125	2	35
1.6	1.5	40	3	30	0.6	225/188	200		210	125	2	35
1.6	1.5	40	3	30	0.6	225/188	450	350	210	125	2	35
1.6	1.5	40	3	30	0.6	225/188	450	350	210	125	2	35
1.6	1.5	40	3	30	0.6	225/188	425	325	210	125	2	35
1.6	1.5	40	3	30	0.6	225/188	400	300	210	125	2	35
1.6	1.5	40	3	30	0.6	225/188	200		210	125	2	35
1.6	1.5	40	3	30	0.6	300/255	450	350	374	125	2	35
1.6	1.5	40	3	30	0.6	300/255	450	350	374	125	2	35
1.6	1.5	40	3	30	0.6	300/255	425	325	374	125	2	35
1.6	1.5	40	3	30	0.6	300/255	400	300	374	125	2	35
1.6	1.5	40	3	30	0.6	300/255	200		374	125	2	35
1.6	1.5	50	3.5	35	0.8	350/300	450	350	510	150	2	35
1.6	1.5	50	3.5	35	0.8	350/300	450	350	510	150	2	35
1.6	1.5	50	3.5	35	0.8	350/300	425	325	510	150	2	35
1.6	1.5	50	3.5	35	0.8	350/300	400	300	510	150	2	35
1.6	1.5	50	3.5	35	0.8	350/300	200		510	150	2	35
1.8	1.5	50	3.5	35	0.8	500/425	450	350	1035	150	2	35
1.8	1.5	50	3.5	35	0.8	500/425	450	350	1035	150	2	35
1.8	1.5	50	3.5	35	0.8	500/425	425	325	1035	150	2	35
1.8	1.5	50	3.5	35	0.8	500/425	400	300	1035	150	2	35
1.8	1.5	50	3.5	35	0.8	500/425	200		1035	150	2	35
1.8	1.5	60	3.5	35	0.8	520/430	650	550	1122	175	2.5	35
1.8	1.5	60	3.5	35	0.8	520/430	650	550	1122	175	2.5	35
1.8	1.5	60	3.5	35	0.8	520/430	600	500	1122	175	2.5	35
1.8	1.5	60	3.5	35	0.8	520/430	500	475	1122	175	2.5	35
1.8	1.5	60	3.5	35	0.8	520/430	250		1122	175	2.5	35
1.8	1.5	60	4	40	0.8	650/550	650	550	1750	175	2.5	35
1.8	1.5	60	4	40	0.8	650/550	650	550	1750	175	2.5	35
1.8	1.5	60	4	40	0.8	650/550	600	500	1750	175	2.5	35
1.8	1.5	60	4	40	0.8	650/550	500	475	1750	175	2.5	35
1.8	1.5	60	4	40	0.8	650/550	250		1750	175	2.5	35
1.8	2	80	5	50	1	950/800	650	550	3745	200	2.5	35
1.8	2	80	5	50	1	950/800	650	550	3745	200	2.5	35
1.8	2	80	5	50	1	950/800	600	500	3745	200	2.5	35
1.8	2	80	5	50	1	950/800	500	475	3745	200	2.5	35
1.8	2	80	5	50	1	950/800	250		3745	200	2.5	35
1.8	2	80	5	50	1	950/800	650	550	3745	200	2.5	35
1.8	2	80	5	50	1	950/800	650	550	3745	200	2.5	35
1.8	2	80	5	50	1	950/800	600	500	3745	200	2.5	35
1.8	2	80	5	50	1	950/800	500	475	3745	200	2.5	35

See "General Notes" on page E6 - 2 and "Electrical Specification Notes" on page E6 - 3.

Thermal Resistance (Steady State) R _{θJC} [R _{θJA}] °C/W (TYP.)											
Pkg. Code	L	F	F2	R	J	W	K	M	D	V	N
Type	 TO-220 Isolated	 TO-202 Type 1 Non-isolated	 TO-202 Type 2 Non-isolated	 TO-220 Non-isolated	 TO-218X Isolated	 TO-218X Non-isolated	 TO-218 Isolated	 TO-218 Non-isolated	 TO-252 D-Pak Surface Mount	 TO-251AA V-Pak Non-isolated	 TO-263 D²Pak Non-isolated
1 A	See below										
6 A	4.0 [50]	4.3 [45]	9.5 [70]						1.7	2.3 [70]	
8 A	3.4	3.9		1.8 [40]					1.5	2.0	
10 A	3.0	3.4		1.6					1.45	1.7	
12 A				1.5					1.4	1.6	
15 A	2.5										
16 A				1.3							1.3
20 A	2.4										
25 A	2.35			1.0							1.0
35 A					0.70		0.70				
40 A				0.6							0.6
55 A				0.5		0.53		0.53			0.5
65 A					0.86		0.86				
70 A						0.60					

Thermal Resistance (Steady State) R _{θJC} [R _{θJA}] °C/W (TYP.)		
Package Code	C	E
Type	 Compak	 TO-92
1 A	35 *	50 [145]

* Mounted on 1cm² copper foil surface; two-ounce copper foil

Electrical Isolation

Teccor's isolated SCR packages will withstand a minimum high potential test of 2500 V ac rms from leads to mounting tab over the device's operating temperature range. The following table shows standard and optional isolation ratings.

Electrical Isolation * from Leads to Mounting Tab			
V AC RMS	TO-220 Isolated	TO-218X Isolated	TO-218 Isolated
2500	Standard	Standard	Standard
4000	Optional **	N/A	N/A

* UL Recognized File #E71639

** For 4000 V isolation, use "V" suffix in part number.

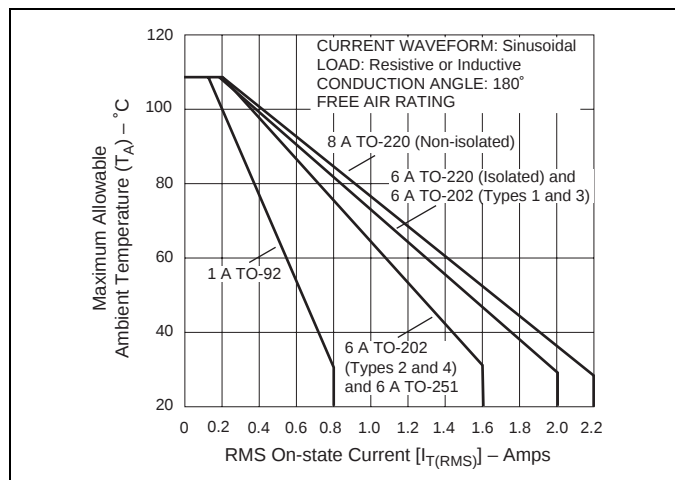


Figure E6.1 Maximum Allowable Ambient Temperature versus RMS On-state Current

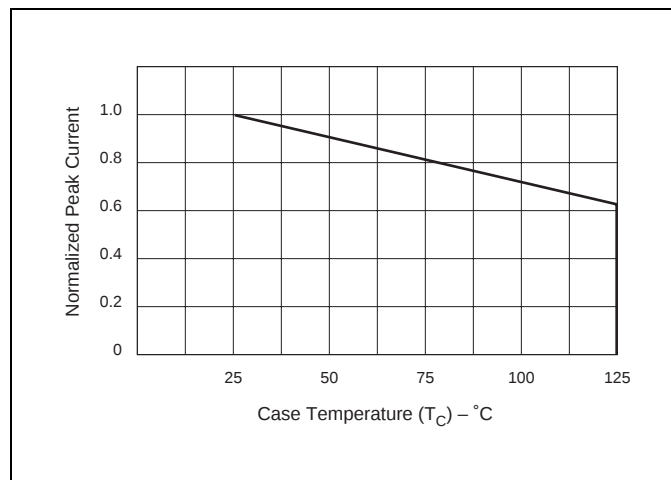


Figure E6.4 Peak Capacitor Discharge Current Derating (6 A through 55 A)

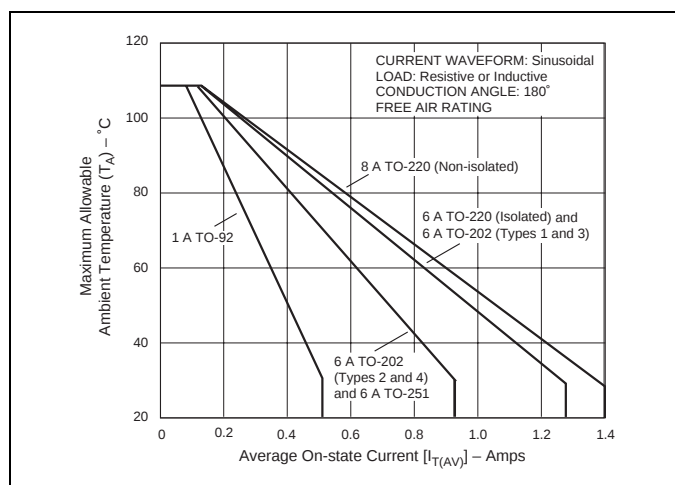


Figure E6.2 Maximum Allowable Ambient Temperature versus Average On-state Current

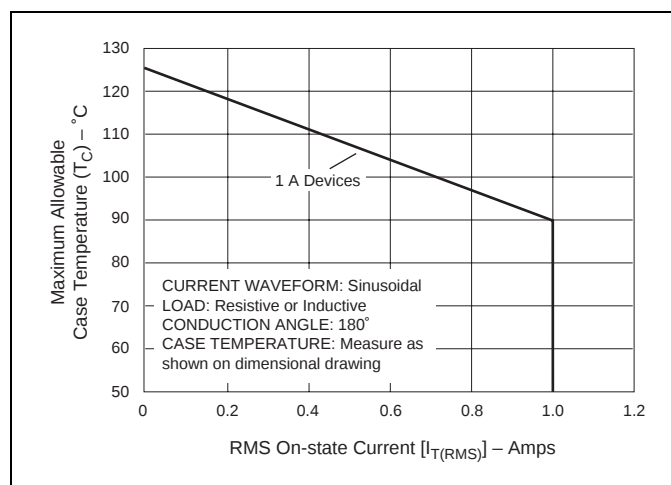


Figure E6.5 Maximum Allowable Case Temperature versus RMS On-state Current (1 A)

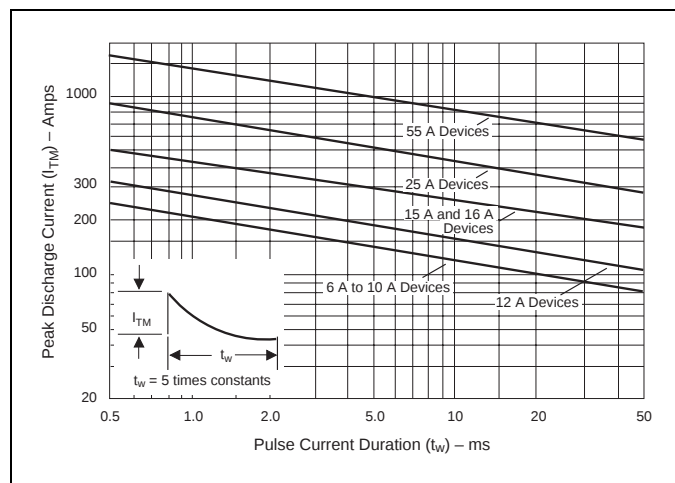


Figure E6.3 Peak Capacitor Discharge Current (6 A through 55 A)

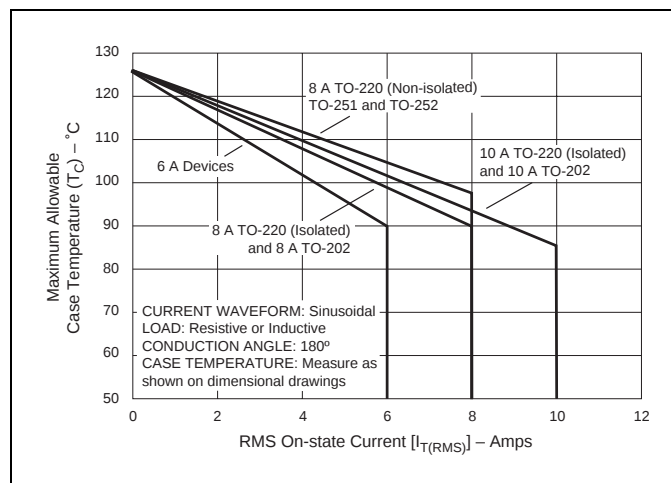


Figure E6.6 Maximum Allowable Case Temperature versus RMS On-state Current (6 A, 8 A, and 10 A)

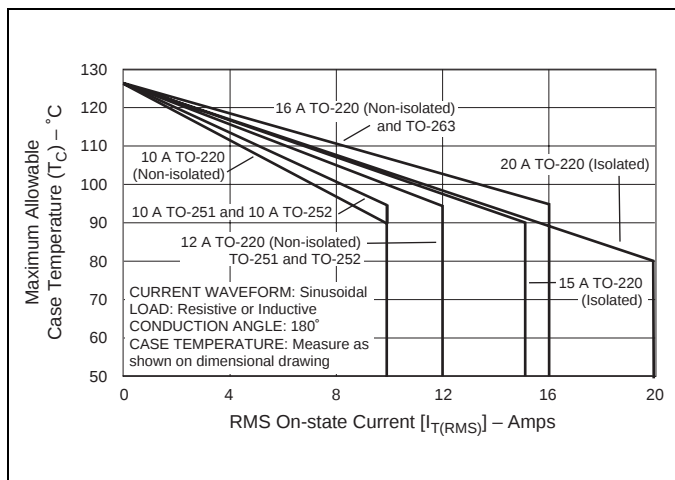


Figure E6.7 Maximum Allowable Case Temperature versus RMS On-state Current (10 A, 12 A, 16 A, and 20 A)

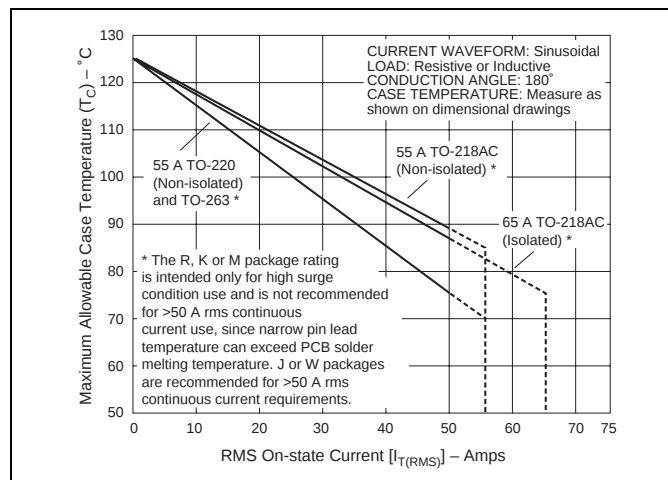


Figure E6.10 Maximum Allowable Case Temperature versus RMS On-state Current (55 A and 65 A)

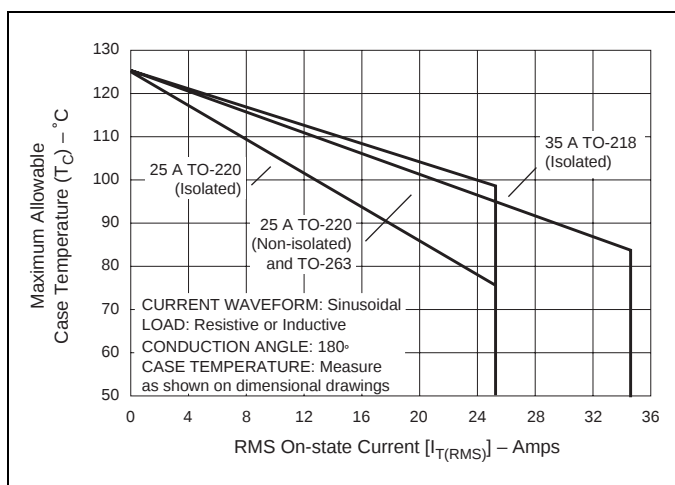


Figure E6.8 Maximum Allowable Case Temperature versus RMS On-state Current (25 A and 35 A)

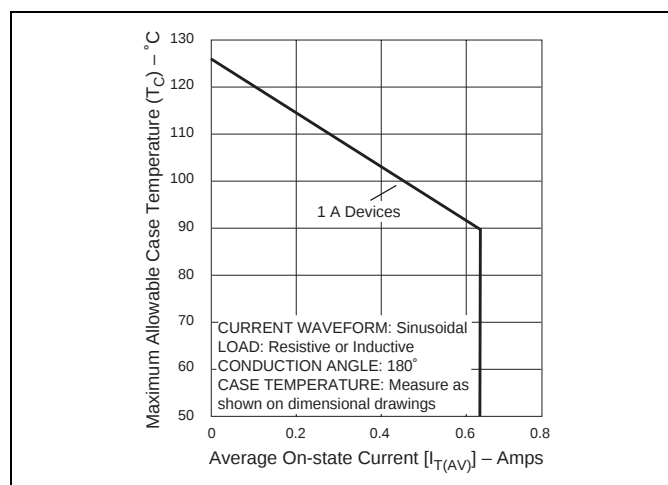


Figure E6.11 Maximum Allowable Case Temperature versus Average On-state Current (1 A)

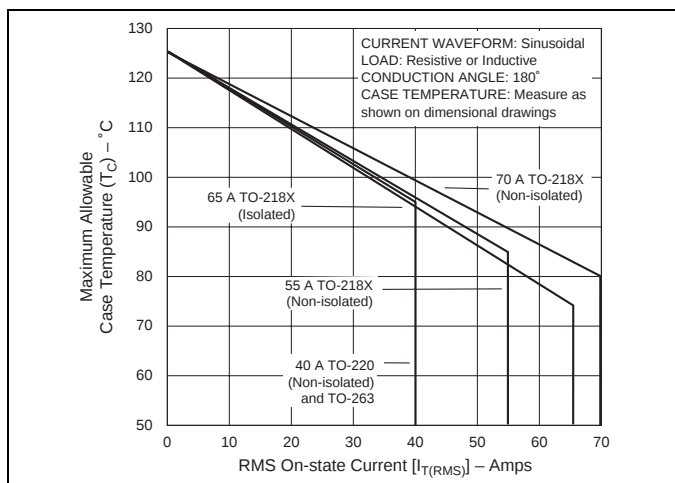


Figure E6.9 Maximum Allowable Case Temperature versus RMS On-state Current (40 A through 70 A)

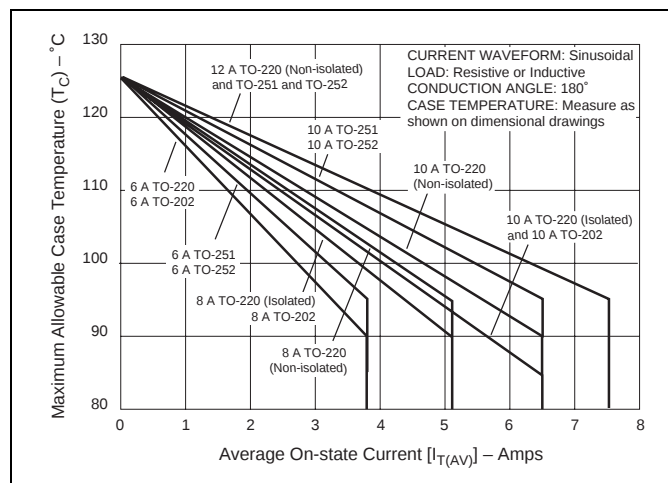


Figure E6.12 Maximum Allowable Case Temperature versus Average On-state Current (8 A, 10 A, and 12 A)

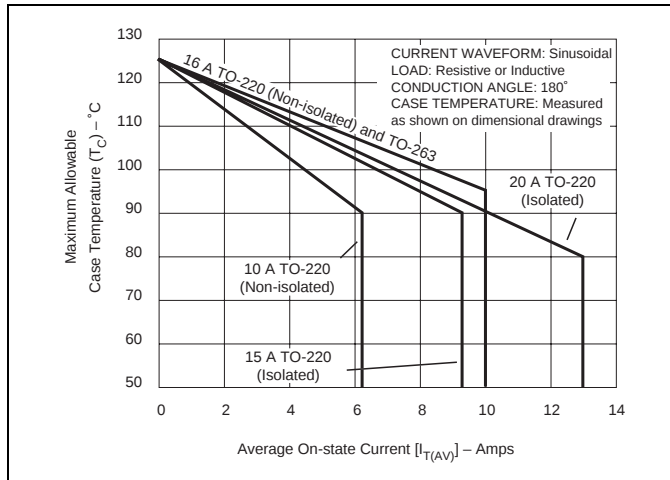


Figure E6.13 Maximum Allowable Case Temperature versus Average On-state Current (10 A through 20 A)

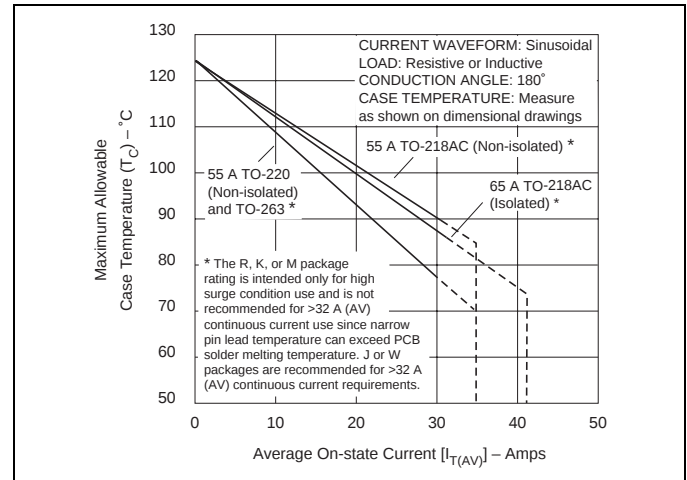


Figure E6.16 Maximum Allowable Case Temperature versus Average On-state Current (55 A and 65 A)

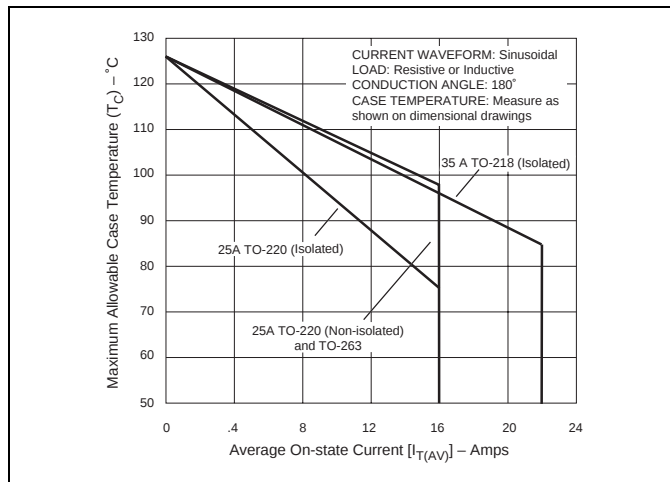


Figure E6.14 Maximum Allowable Case Temperature versus Average On-state Current (25 A and 35 A)

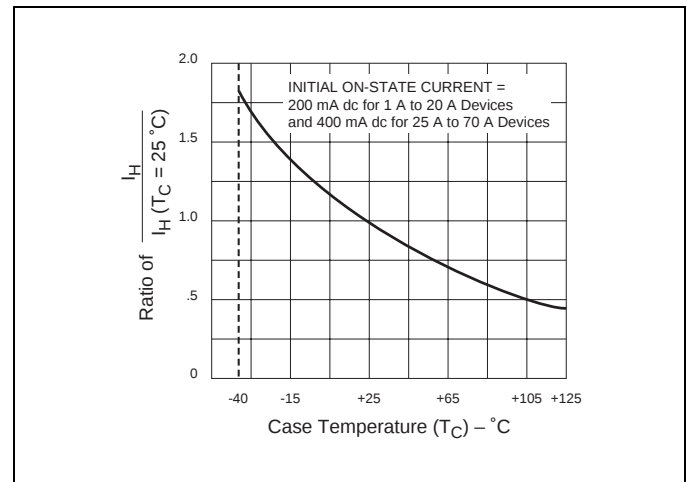


Figure E6.17 Normalized dc Holding Current versus Case Temperature

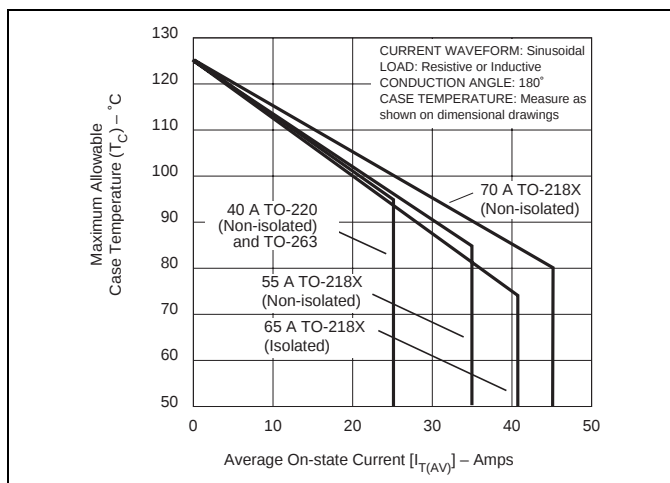


Figure E6.15 Maximum Allowable Case Temperature versus Average On-state Current (40 A through 70 A)

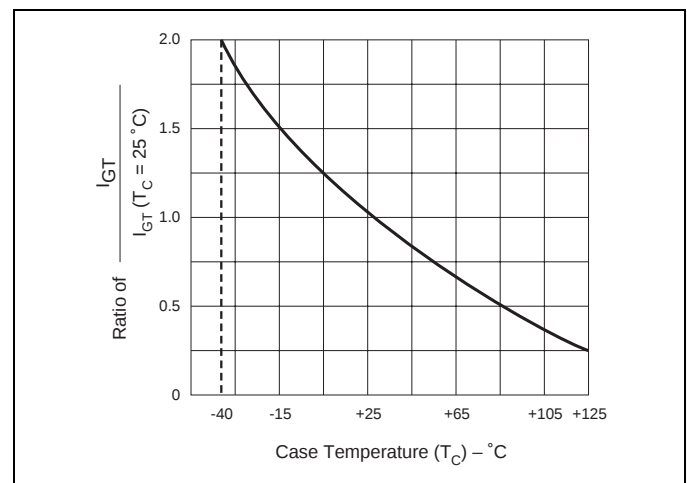


Figure E6.18 Normalized DC Gate-Trigger Current versus Case Temperature

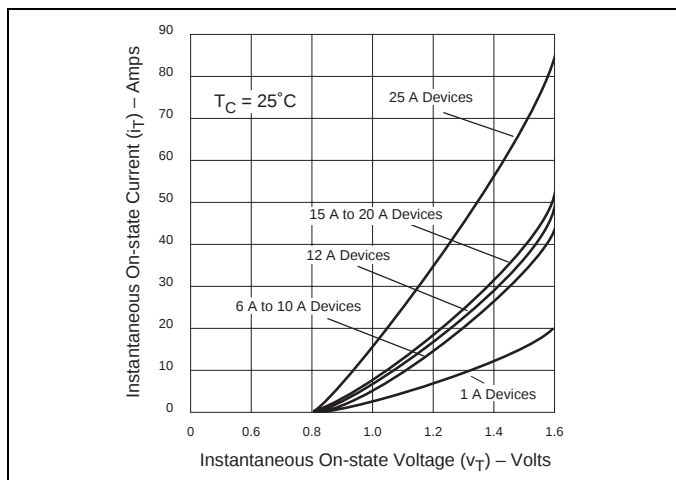


Figure E6.19 Instantaneous On-state Current versus On-state Voltage (Typical) (6 A through 25 A)

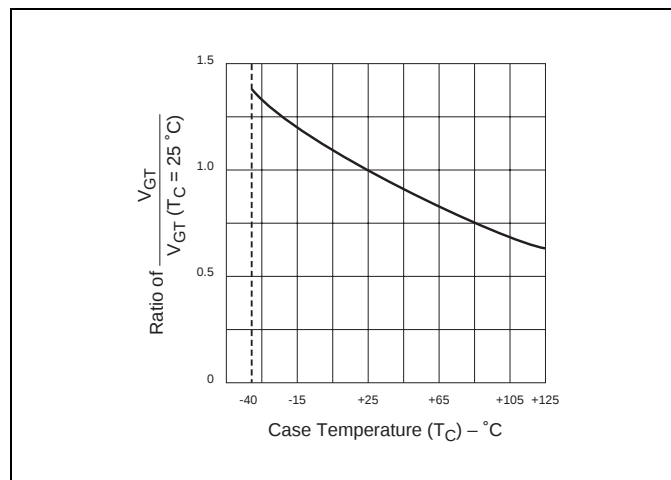


Figure E6.21 Normalized DC Gate-trigger Voltage versus Case Temperature

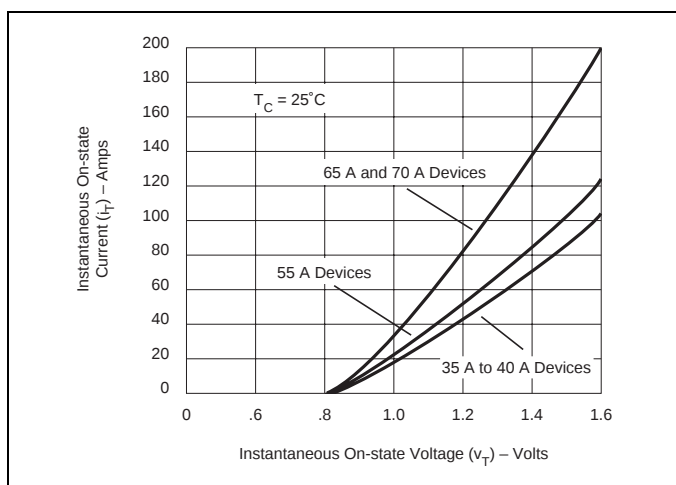


Figure E6.20 Instantaneous On-state Current versus On-state Voltage (Typical) (35 A through 70 A)

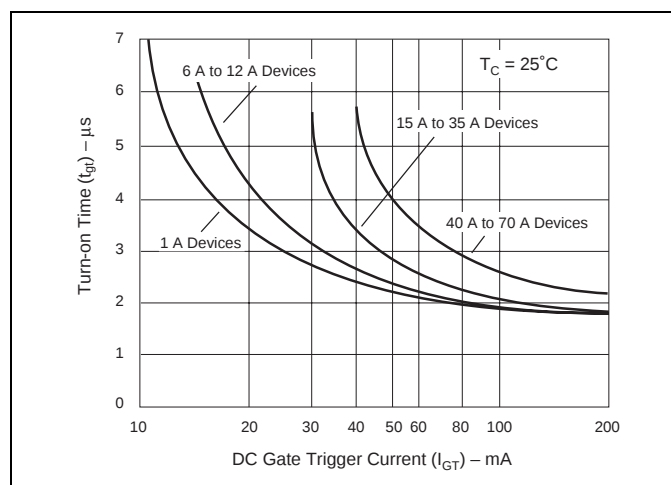


Figure E6.22 Typical Turn-on Time versus Gate-trigger Current

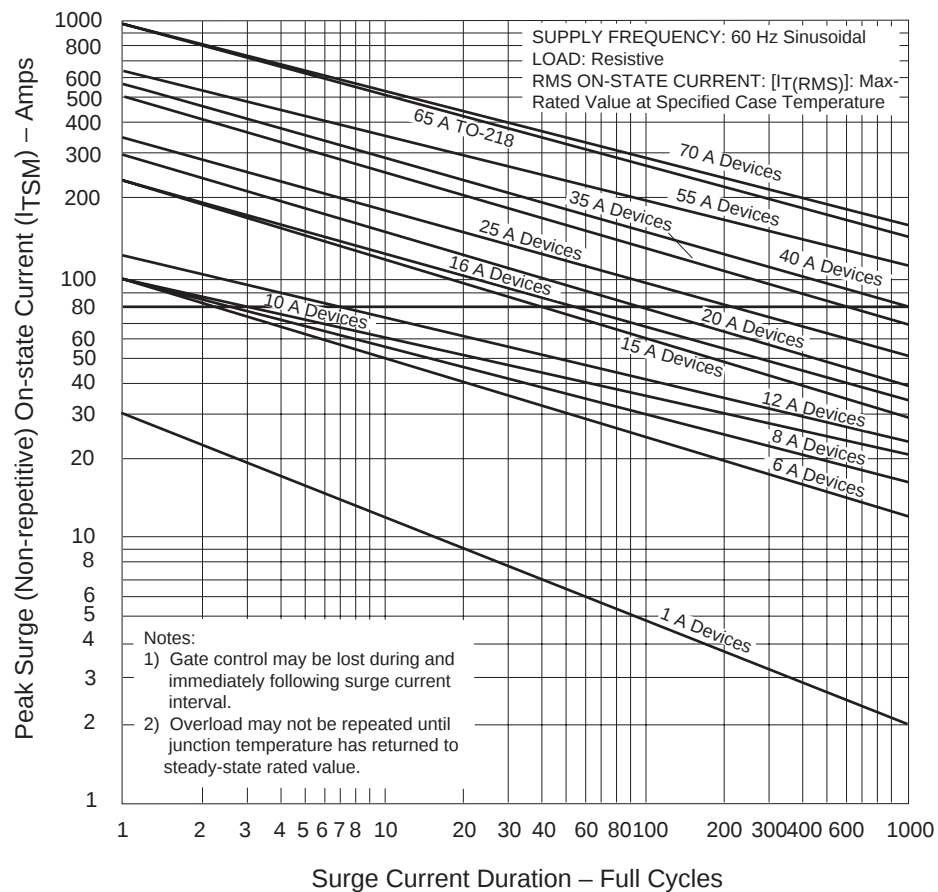


Figure E6.23 Peak Surge Current versus Surge Current Duration

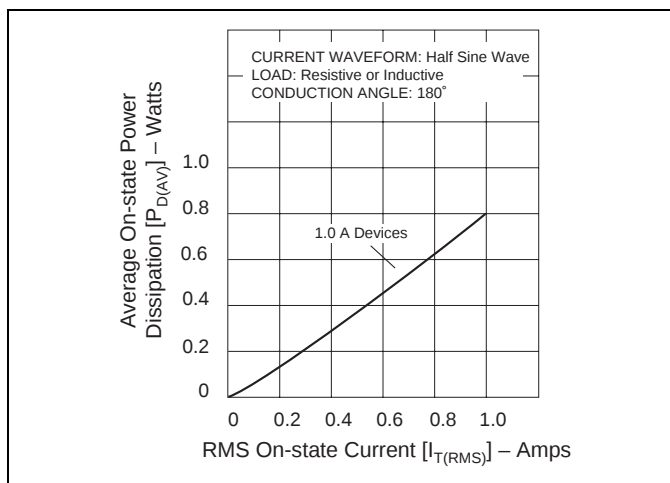


Figure E6.24 Power Dissipation (Typical) versus RMS On-state Current (1 A)

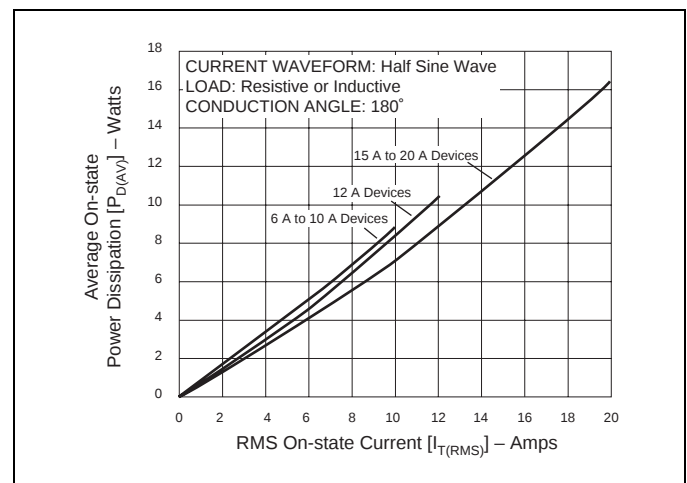


Figure E6.25 Power Dissipation (Typical) versus RMS On-state Current (6 A through 20 A)

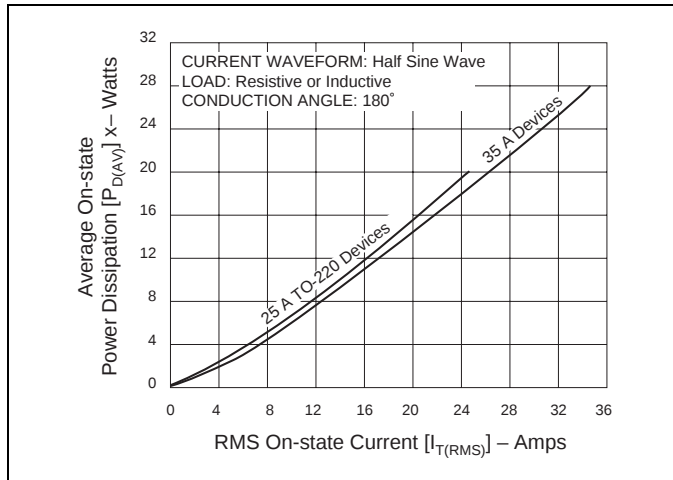


Figure E6.26 Power Dissipation (Typical) versus RMS On-state Current (25 A and 35 A)

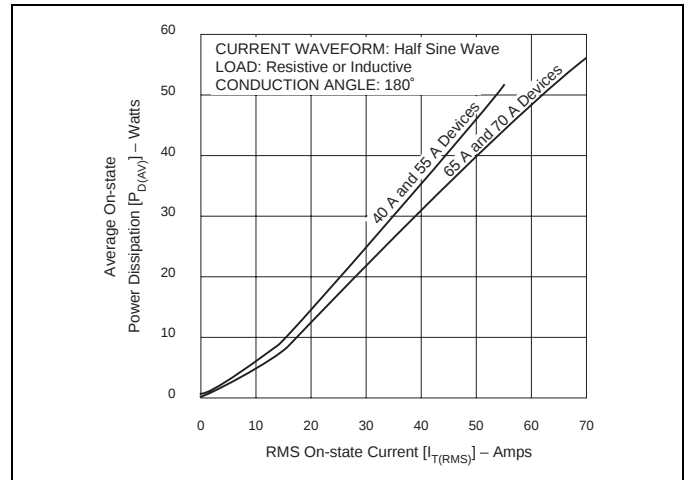


Figure E6.27 Power Dissipation (Typical) versus RMS On-state Current (40 A through 70 A)