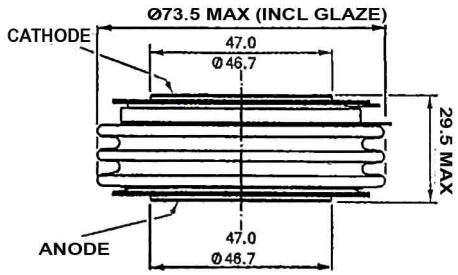
AMERICAN MICROSEMICONDUCTOR
Advancing the Semiconductor Industry Since 1972

High Power	DCR1003 Series
Button Capsule	DCR1004 Series
Thyristor	$I_{T(AV)}$ = 1540A
	V_{RRM} = 1700V

Type Number	Non-Repetitive Peak Voltages V_{DSM} V_{RSM}	Repetitive Peak Voltages V_{DRM} V_{RRM}
DCR1003SN1818 DCR1004SN1818	1800	1700.
DCR1003SN1717 DCR1004SN1717	1700	1600.
DCR1003SN1616 DCR1004SN1616	1600	1500.
DCR1003SN1515 DCR1004SN1515	1500	1400.
DCR1003SN1414 DCR1004SN1414	1400	1300.
DCR1003SN1313 DCR1004SN1313	1300	1200.
DCR1003SN1212 DCR1004SN1212	1200	1100.
DCR1003SN1111 DCR1004SN1111	1100	1000.
DCR1003SN1010 DCR1004SN1010	1000	900.
DCR1003SN0909 DCR1004SN0909	900	800.
DCR1003SN0808 DCR1004SN0808	800	700.
DCR1003SN0707 DCR1004SN0707	700	600.
DCR1003SN0606 DCR1004SN0606	600	500.
DCR1003SN0505 DCR1004SN0505	500	400.
DCR1003SN0404 DCR1004SN0404	400	300.
DCR1003SN0303 DCR1004SN0303	300	200.
DCR1003SN0202 DCR1004SN0202	200	150.
DCR1003SN0101 DCR1004SN0101	100	75.

OUTLINE N



Weight 530 g
Minimum clamping force 18.0 kN
Maximum clamping force 22.0 kN

CURRENT RATINGS— DOUBLE SIDE COOLED				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load T_{HS} = 55°C		1540 A
I_{RMS}	RMS value	T_{HS} = 55°C		2420 A
I_T	Continuous (direct) on-state current	T_{HS} = 55°C		2050 A
$R_{th(j-h)}$	Thermal resistance junction to	Clamping force 19.5kN	d.c.	.026°C/W
	heatsink surface	(with mounting grease)	Half-wave	.028°C/W
			3-phase	.030°C/W
CURRENT RATINGS—SINGLE SIDE COOLED				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load T_{HS} = 55°C		870 A
I_{RMS}	RMS value	T_{HS} = 55°C		1365 A
I_T	Continuous (direct) on-state current	T_{HS} = 55°C		1060 A
$R_{th(j-h)}$	Thermal resistance junction to	Clamping force 19.5kN	d.c.	.06°C/W
	heatsink surface	(with mounting grease)	Half-wave	.062°C/W
			3-phase	.064°C/W
SURGE RATINGS				
I_{TRM}	Repetitive peak on-state current	Sinusoidal waveform conduction angle		14920 A
		ϕ = 30° T_{HS} = 55°C		
I^2t	I^2t for fusing	10mS half sine T_J = 125°C		2205000 A^2sec
		3mS half sine T_J = 125°C		1540000 A^2sec
I_{TSM}	Surge (non-repetitive) on-state current	With 50% V_{RSM} TJ = 125°C		21000 A
dI_T/dt	Rate of rise of on-state current	From V_D to 1000A, Gate source 10V		100A/µs
		5Ω rise time 0.5µs, T_J = 125°C		
dv/dt*	Max linear rate of rise of off-state voltage	Voltage = 67%V_{DRM}, T_{case} = 125°C		300 V/ µs
*Higher values available.				
GATE RATINGS				
V_{FGM}	Peak forward gate voltage	Anode positive with respect to cathode		30 V
V_{FGN}	Peak forward gate voltage	Anode negative with respect to cathode		0.25 V
V_{RGM}	Peak reverse gate voltage			5 V
I_{FGM}	Peak forward gate current	Anode positive with respect to cathode		10 A
P_{GM}	Peak gate power	Pulse width = 100µ		150 W
P_G	Mean gate power			10 W
TEMPERATURE & FREQUENCY RATINGS				
T_{VJ}	Virtual junction temperature	On-state (conduction)		135°C
		Off-state (blocking)		125°C
T_{stg}	Storage temperature range		-55 to	125 °C
F	Frequency range		10 to	400 Hz

Tel. 1-973-377-9566 Fax. 1-973-377-3078
133 Kings Road
Madison, New Jersey 07940
United States of America

www.americanmicrosemi.com

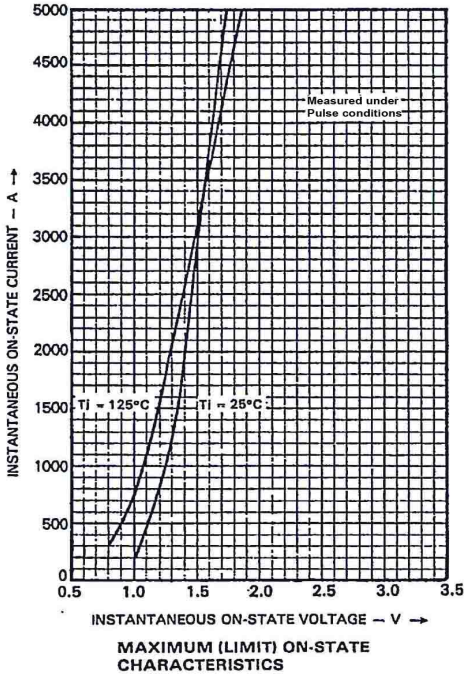
DEKRA Certification Inc.
AS9100C and ISO 9001:2008
Certificate No. 131519.01

DCR1003 Series
DCR1004 Series
$I_{T(AV)}$ = 1540 A
V_{RRM} = 1700 V

CHARACTERISTICS— T_{case} = 25°C unless otherwise stated

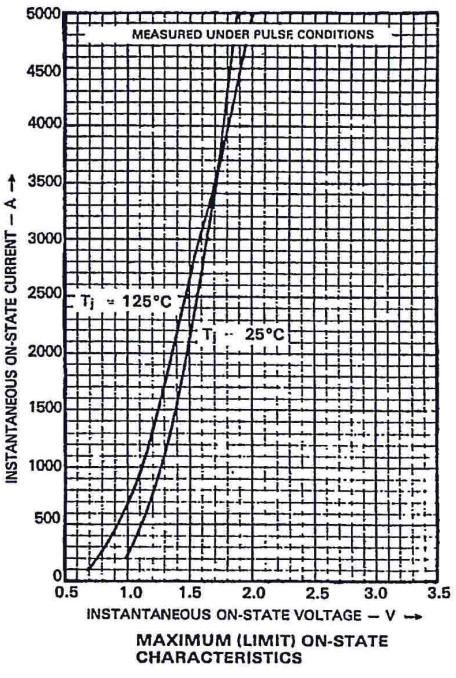
				LIMIT				
				5%	Typ	95%	Max	Units
V_{TM}	On-state voltage	At 2900A peak	DCR 1003				1.5	V
			DCR1004				1.625	V
I_{DM}	Peak off-state current	T_{case} = 125°C					50	mA
I_{RM}	Peak reverse current	T_{case} = 125°C					50	mA
I_L	Latching current	V_D = 5V T_p = 30µS			120			mA
I_H	Holding current	V_D = 5V Gate open circuit			77			mA
td	Delay time	V_D = 100V, Gate source = 25V 5Ω		0.58	0.8	1.52		µs
tq	Circuit commutated	I_T = 800A, V_{RRM} = 50V, dI_{RR}/dt = 20A/µS		90	215	380		µs
	Turn-off time	V_{DR} = full rated V_D,						
		dV_{DR}/dt = 20V/µs linear , T_{case} = 125°C						
V_{GT}	Gate trigger voltage	V_{DRM} = 5V					3.5	V
V_{GD}	Gate non-trigger voltage	At V_{DRM}, T_{case} = 5V					0.25	V
I_{GT}	Gate trigger current	V_{DWM} = 5V					200	mA

DCR 1003



MAXIMUM (LIMIT) ON-STATE CHARACTERISTICS

DCR 1004



MAXIMUM (LIMIT) ON-STATE CHARACTERISTICS

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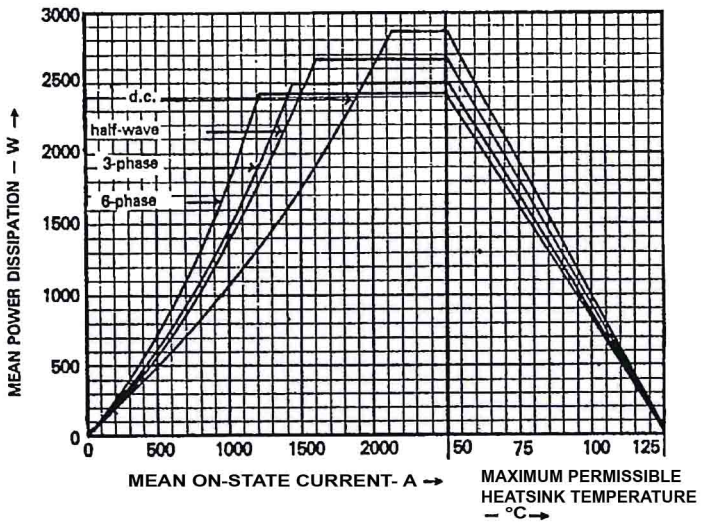
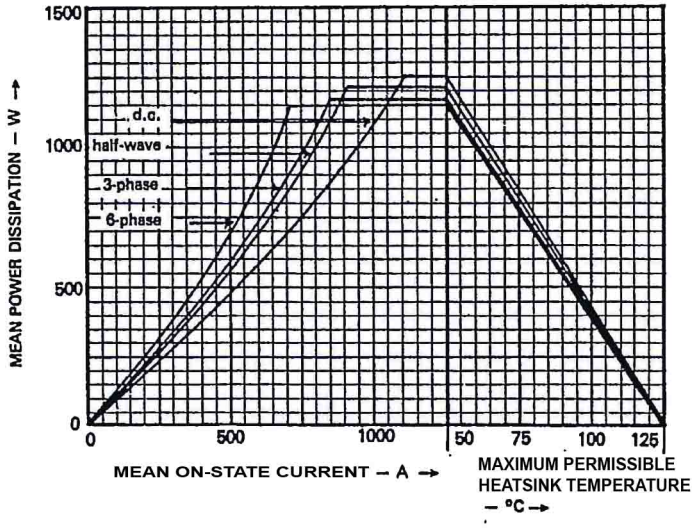
DCR1003 Series
DCR1004 Series
$I_{T(AV)}$ = 1540 A
V_{RRM} = 1700 V
T-25-21



DISSIPATION CURVERS:
DOUBLE SIDE COOLED



DISSIPATION CURVERS:
SINGLE SIDE COOLED

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DCR1003 Series
DCR1004 Series
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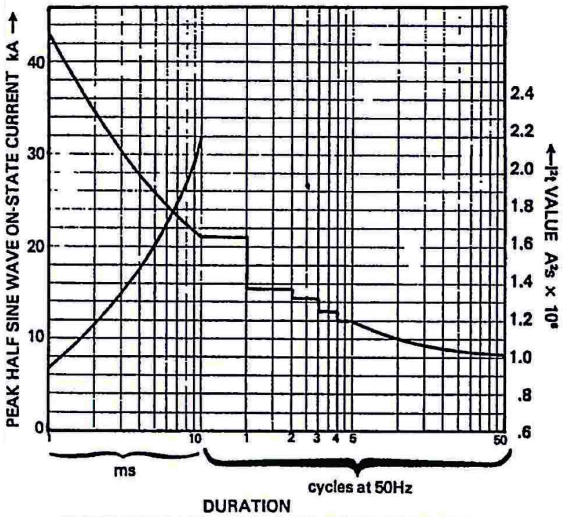
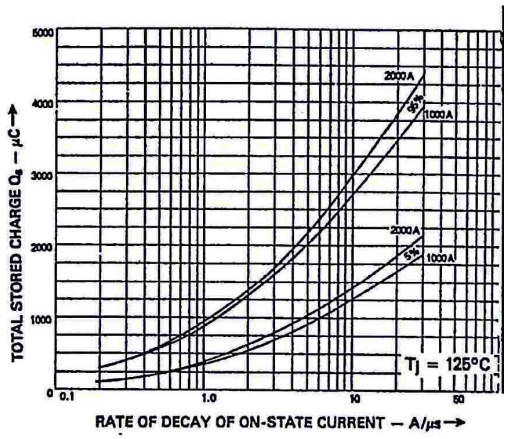
V_{RRM} = 1700 V

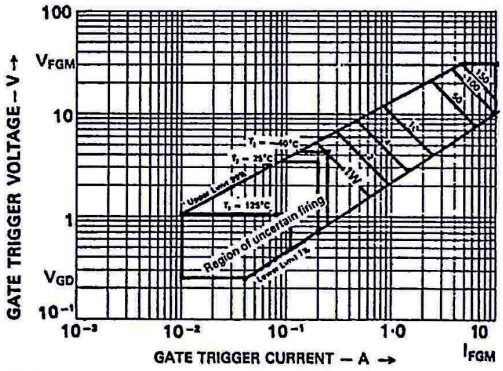


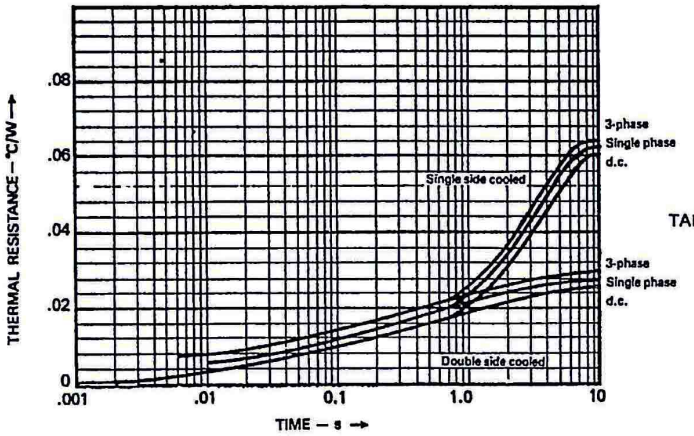
SURGE (NON-REPETITIVE) ON-STATE CURRENT VERSUS TIME (with 50% V_{RSM} T_{case} 125°C)

$$I^2t = \frac{I^2 \times t}{2}$$



STORED CHARGE





MAXIMUM (LIMIT) TRANSIENT THERMAL RESISTANCE

Pulse Width µs	Pulse Frequency Hz		
	50	100	400
100	150	150	150
200	150	150	125
500	150	150	100
1mS	150	100	25
10mS	20	10	2.5

TABLE GIVES GATE PULSE POWER P_{GM} IN WATTS

GATE CHARACTERISTICS

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