

1200mW Surface Mount Current Regulative Diodes - 50mA

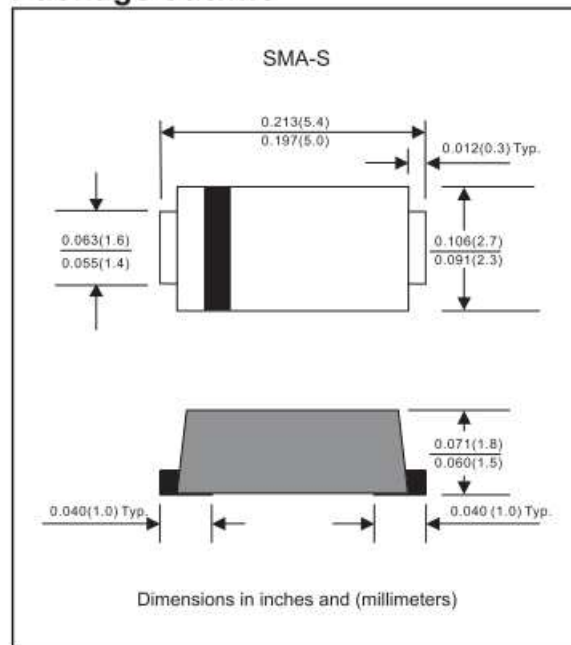
Features

- ◆ Low start-up stabilized current supply voltage.
- ◆ High dynamic impedance.
- ◆ Constant-current range: 50mA
- ◆ Be paralleled for current extension.
- ◆ Negative temperature coefficient for LED protection under high temperature.
- ◆ Suffix "-H" indicates Halogen-free part, ex.ECCR503ASHR.

Mechanical Data

- ◆ Epoxy : UL94-V0 rated flame retardant
- ◆ Case : Molded plastic, DO-214AC / SMA-S
- ◆ Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- ◆ Polarity : Indicated by cathode band
- ◆ Mounting Position : Any
- ◆ Weight : Approximated 0.05gram

Package outline



Maximum Ratings($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Rating power Note1	P_D			1200	mW
Rating voltage (Pulse wave) Note 2	V_{RM}			100	V
Pinch-off current	I_p			50	mA
Operating junction temperature range	T_J	-30		+125	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-30		+125	$^{\circ}\text{C}$

Note 1: Using Al @900mm²,thickness 1.5mm,in still air

Note 2: Pulse wave width 300us

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Electrical Characteristics

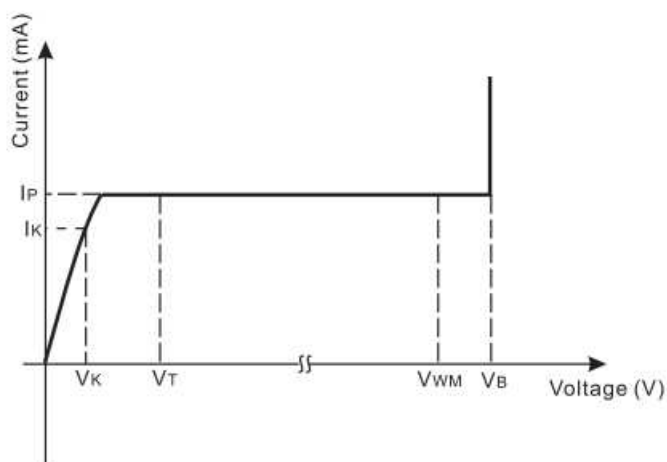
Part No.	Marking code	Pinch-off current*1				Limiting current*2		Limiting Currentratio I _{50v} /I _p	Temperature*3 Coefficient (% / °C)	Maximum Rating Voltage (V _{max})
		Test Voltage (V)	I _p (mA) Typical	MIN.	MAX.	V _k (V)	I _k (mA)			
ECCR503ASR ECCR503ASHR	C2	17	50.0	45.0	55.0	8.5	0.8I _{pmin}	*1.0 max	-0.3max	100

Note : *1 I_p is measured after applying the test voltage for 400 secs duration

*2 Pinch-off current limiting current are by impulse wave at 25°C

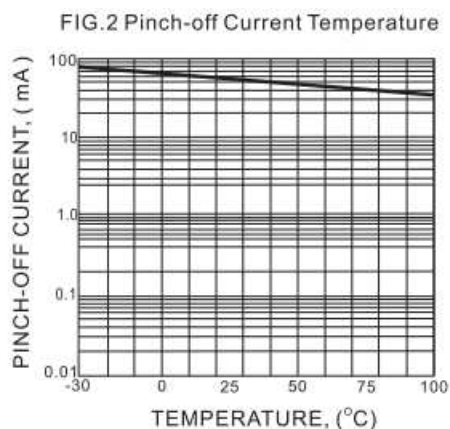
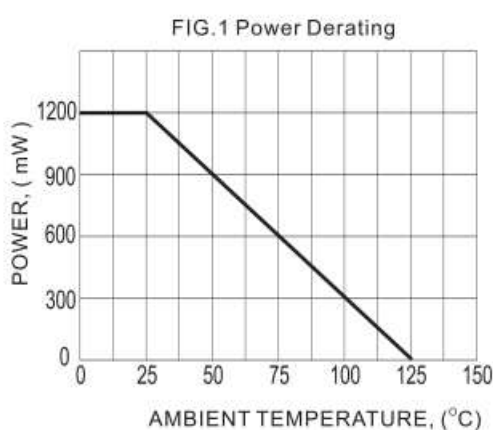
*3 Temperature coefficient is measured between 25°C and 50°C

Basic Characteristics



I_k: 0.8I_P
 I_P: Pinch-off current
 V_k: Voltage which produces 0.8I_P
 or greater current
 V_T: Test voltage
 V_B: Breakdown voltage
 V_{WM}: Maximum Working voltage

Rating and characteristic curves



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FIG.3

CRD in parallel:

The use of CRD in parallel increases their current handling capabilities.

Increasing the voltage range using a zener diode:

Connecting zener diodes in series with the line ensures that the current is constant in high voltage area.

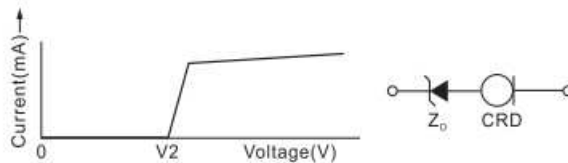
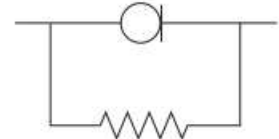


FIG.4

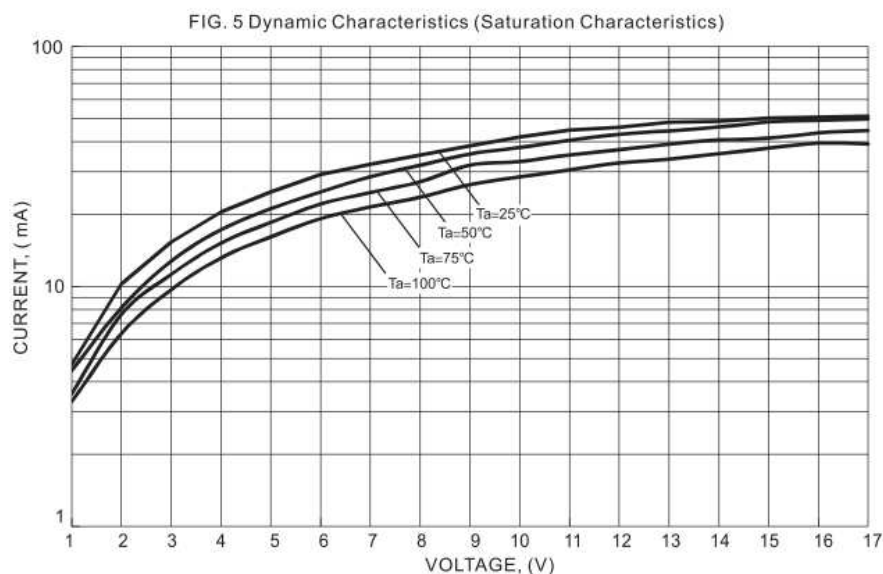
The compensation of current reduction due to self heating:

Placing resistors in parallel with CRD can correct any current decrease when the applied voltage increases. The following values are typical for correction resistors:

ECCR503AS 10.6K Ω



Compensative resistor is not necessary if the current value is less than 1 mA.



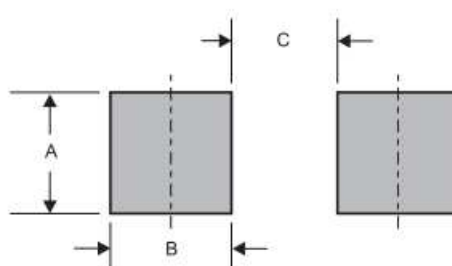
Note 1: The test time of each voltage is 10 seconds
2: Using Al @900mm², thickness 1.5mm, in still air

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Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Suggested solder pad layout



Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMA-S	0.063 (1.60)	0.059 (1.50)	0.110 (2.80)

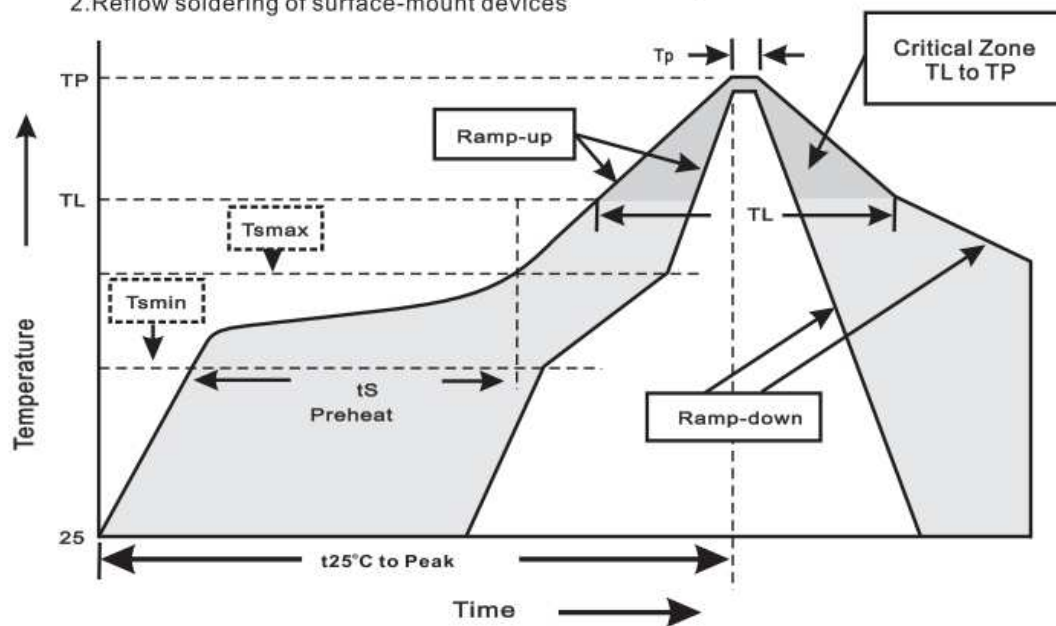
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA. (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SMA-S	7"	2,000	4.0	20,000	183*170*183	178	382*356*387	160,000	15.5
	13"	7,500	4.0	15,000	337*337*37	330	350*330*360	120,000	14.2

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smin}) -Temperature Max(T _{smax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes