Description

The CR range of protectors are based on the proven technology of the T10 thyristor product. Designed for transient voltage protection of telecommunications equipment, it provides higher power handling than a conventional avalanche diode (TVS) and when compared to a GDT offers lower voltage clamping levels and infinite surge life.
Packaged in a transfer molded DO-214AA surface mount outline designed for high speed pick & place machines used in today's surface mount assembly lines.

Electrical Charecteristics
The electrical characteristics of a CRXXXX device is similar to that of a self gated Triac, but the CR is a two terminal device with no gate. The gate function is achieved by an internal current controlled mechanism.

Like the T.T.S. diodes, the CRXXXX has a standoff voltage (Vrm) which should be equal to or greater than the operating voltage of the system to be protected. At this voltage (Vrm) the current consumption of the CRXXXX is negligible and will not effect the protected system.

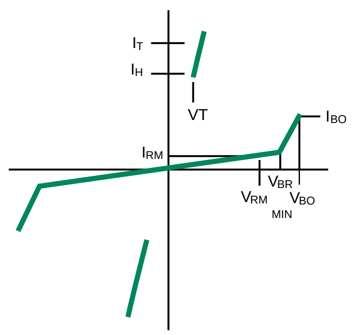
When a transient occurs, the voltage across the CRXXXX will increase until the breakdown voltage (Vbr) is reached. At this point the device will operate in a similar way to a T.V.S. device and is in an avalanche mode.

The voltage of the transient will now be limited and will only increase by a few volts as the device diverts more current. As this transient current rises, a level of current through the device is reached (Ibo) which causes the device to switch to a fully conductive state such that the voltage across the device is now only a few volts (Vt). The voltage at which the device switches from the avalanche mode to the fully conductive state (Vt) is known as the Breakover Voltage (Vbo). When the device is in the Vt state, high currents can be deverted without damage to the CRXXXX due to the low voltage across the device, since the limiting factor in such devices is dissipated power (V x I).

Resetting of the device to the non conducting state is controlled by the current flowing through the device. When the current falls below a certain value, known as the Holding Current (Ih), the device resets automatically.

As with the avalanche T.V.S. device, if the CRXXXX is subjected to a surge current which is beyond its maximum rating, then the device will fail in short circuit mode, this ensures that the equipment is ultimately protected.

Selecting A CRXXXX
1. When selecting a CRXXXX device, it is important that the Vrm of the device is equal to or greater than the operating voltage of the system.
2. The minimum Holding Current (Ih) must be greater than the current the system is capable of delivering otherwise the device will remain conducting following a transient condition.



V-I Graph Illustrating Symbols and Terms for the CR Surge Protection Device.

The CRXXXX Range Can Be Used to Protect Against Surges As Defined In The Following International Standards.					
			SA	SB	SC
FCC Rules Part 68/D	Metallic Longitudinal	10/560µs 10/160µs	50A 100A	100A 150A	100A 200A
Bellcore Specification	TR-NWT-001089	10/1000µs 2/10µs 100v/µs	37A - 1KV	75A - 1KV	100A 500A 1KV
ITU K-17 (Formerly CCITT)	Voltage Wave Form Current Wave Form	100/700µs 5/310µs	- -	1.5KV 38A	1.5KV 38A
VDE 0433	Voltage Wave Form Current Wave Form	10/700µs 5/310µs	- -	2KV 50A	4.0KV 100A
C-NET 131-24	Voltage Wave From Current Wave Form	0.5/700µs 0.8/310µs	1.0KV 25A	1.0KV 25A	4.0KV 100A
IEC 1000-4-5	(Discharge through 2Ω impendance) I Voltage Wave Form	8/20µs 1-2/50µs	- -	100A 300V	250A 500V
ITU K-20 (Formerly CCITT)	Voltage Wave Form Current Wave Form	10/700µs 5/310µs	1000V 25A	10000V 25A	4000V 100A

Specifications

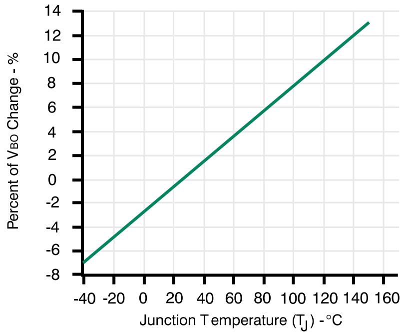
Electrical Charecteristics (Tj=25°C)

SYMBOL	PARAMETER	SYMBOL	PARAMETER
V_{RM}	Stand-off Coltage	I_{RM}	Stand-off Current
V_{BR}	Breakdown Voltage	I_{BO}	Breakover Current
V_{BO}	Breakover Voltage	I_H	Holding Current
V_T	On-State Voltage		

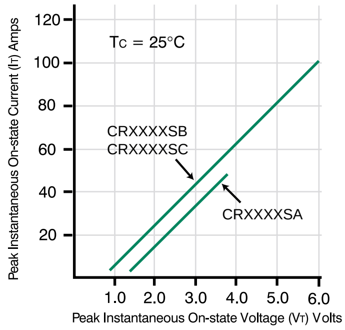
THERMAL DATA		VALUE	UNIT
T stg	Storage and Operating Junction Temperature range	-40 to +150	°C
Tj		150	°C
TL	Maximum Temperature For Soldering (For period of 10 seconds max)	230	°C

	Stock Number	Device Code	Reverse Stand-off Voltage	Maximum Reverse Leakage µA	Maximum Breakover Voltage @Ibo	Maximum Breakover Current mA	Minimum Holding Current mA	Maximum On-State Voltage @1A	Typical Capacitance @1MHz 2v bias pF
MAXIMUM RATINGS	CR 0300 SA	030A	25	5	40	800	150	5	100
SUFFIX SA	CR 0640 SA	064A	58	5	77	800	150	5	60
	CR 0720 SA	072A	65	5	88	800	150	5	60
Ipp 10x160µs Amps 100	CR 0800 SA	080A	75	5	98	800	150	5	60
Ipp 10x560µs Amps 50	CR 1100 SA	110A	90	5	130	800	150	5	60
I_{TSM} 60Hz Amps 20	CR 1300 SA	130A	120	5	160	800	150	5	40
DI/dt Amps/µs 500	CR 1500 SA	150A	140	5	180	800	150	5	40
	CR 1800 SA	180A	160	5	220	800	150	5	40
MAXIMUM RATINGS	CR 2300 SA	230A	190	5	260	800	150	5	30
SUFFIX SB	CR 2600 SA	260A	220	5	300	800	150	5	30
Ipp 10x160µs Amps 150	CR 3100 SA	310A	275	5	350	800	150	5	30
Ipp 10x560µs Amps 100	CR 3500 SA	350A	320	5	400	800	150	5	30
I_{TSM} 60Hz Amps 30	CR 0300 SB	030B	25	5	40	800	150	5	100
DI/dt Amps/µs 500	CR 0640 SB	064B	58	5	77	800	150	5	60
	CR 0720 SB	072B	65	5	88	800	150	5	60
	CR 0800 SB	080B	75	5	98	800	150	5	60
	CR 1100 SB	110B	90	5	130	800	150	5	60
	CR 1300 SB	130B	120	5	160	800	150	5	40
	CR 1500 SB	150B	140	5	180	800	150	5	40
	CR 1800 SB	180B	160	5	220	800	150	5	40
	CR 2300 SB	230B	190	5	260	800	150	5	30
	CR 2600 SB	260B	220	5	300	800	150	5	30
	CR 3100 SB	310B	275	5	350	800	150	5	30
	CR 3500 SB	350B	320	5	400	800	150	5	30
MAXIMUM RATINGS	CR 0300 SC	030C	25	5	40	800	150	5	200
SUFFIX SC	CR 0640 SC	064C	58	5	77	800	150	5	120
Ipp 2x10µs Amps 500	CR 0720 SC	072C	65	5	88	800	150	5	120
Ipp 10x160µs Amps 200	CR 0800 SC	080C	75	5	98	800	150	5	120
Ipp 10x560µs Amps 100	CR 1100 SC	110C	90	5	130	800	150	5	120
I_{TSM} 60Hz Amps 60	CR 1300 SC	130C	120	5	160	800	150	5	80
dI/dt Amps/µs 500	CR 1500 SC	150C	140	5	180	800	150	5	80
	CR 1800 SC	180C	160	5	220	800	150	5	80
	CR 2300 SC	230C	190	5	260	800	150	5	60
	CR 2600 SC	260C	220	5	300	800	150	5	60
	CR 3100 SC	310C	275	5	350	800	150	5	60
	CR 3500 SC	350C	320	5	400	800	150	5	60

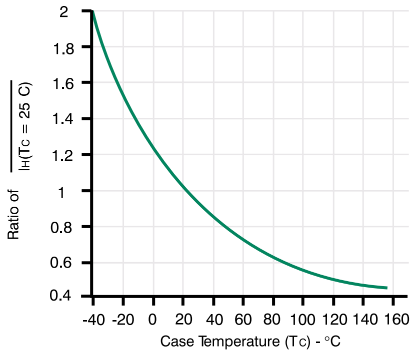
TYPICAL V_{BO} CHANGE vs JUNCTION TEMPERATURE



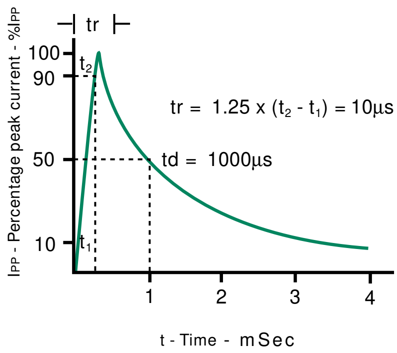
ON-STATE VOLTAGE (VT) vs ON-STATE CURRENT (IT)



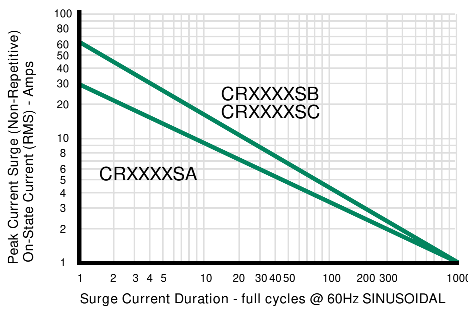
TYPICAL DC HOLDING CURRENT vs CASE TEMPERATURE



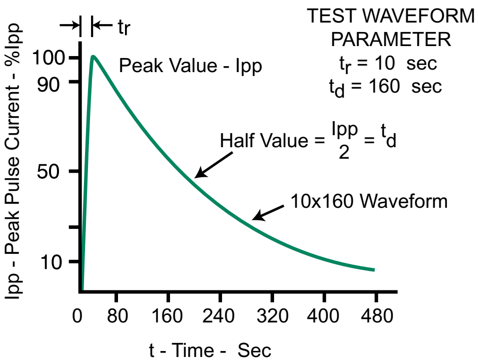
PULSE WAVE FORM (10/10000µS)



PEAK SURGE ON-STATE CURRENT VS. SURGE CURRENT DURATION



10x160µs PULSE WAVE FORM



10x560µs PULSE WAVE FORM