

COM-TECH
 A DIVISION OF SEMITRONICS CORP.
SOLID STATE RELAY

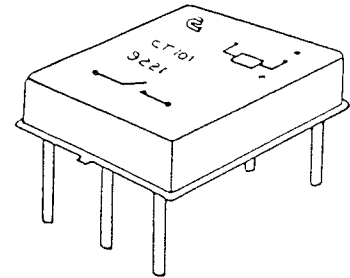
SERIES CT-101
CT-102
CT-103

FEATURES

- o Bi-directional Power Mosfet output stage
- o Extremely low output leakage
- o Optical isolation
- o Available to W and Y MIL-R -28750C screening
- o QPL approved to DESC drawing # 89116

APPLICATIONS

- o Instrumentation
- o Medical Electronics
- o Process Controls
- o Robotics
- o Automatic Test Equipment
- o Automotive Applications
- o Programmable Controllers, etc.



DESCRIPTION

The CT-100 series solid state relays offer high current and low leakage for high performance switching. These relays are packaged in a low profile 6 pin mini - dip package. The operation and the electrical parameters are rated over the full military temperature range.

Back to back Mosfet outputs offer extremely low offset voltage and low On resistance. Three versions are available to accommodate a wide range of switching applications. Optical coupling provides a high degree of isolation from inputs to outputs.

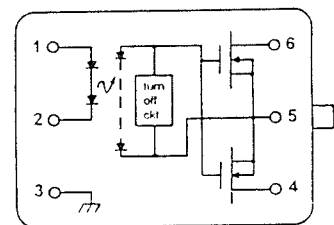
The CT-100 series of relays are manufactured using state of the art hybrid circuit technology to insure high reliability and low life cycle cost for critical applications.

Additional options of On resistance and output voltage are also available as well as commercial grade relays. Please consult our sales department for further information regarding specific requirements. Full custom designs services are also available.

PART No.	RELAY TYPE
CT-101	BI - DIRECTIONAL 1.0 AMP 80 VOLTS
CT-102	BI - DIRECTIONAL 0.6 AMP 180 VOLTS
CT-103	BI - DIRECTIONAL 350 Ma 350 VOLTS

PIN CONNECTIONS

INPUTS 1, 2
 OUTPUTS 4, 5, 6 CASE 3



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ELECTRICAL SPECIFICATIONS

(-55° TO 120° AMBIENT TEMPERATURE UNLESS OTHERWISE NOTED)

CT-101

CT-102

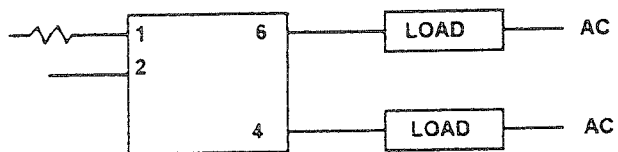
CT-103

OUTPUT (LOAD) SPECIFICATIONS Bi- Directional and AC Configurations (Pin 4 to Pin 6) See Note 2)		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	UNITS
Continuous Load Current (See Fig. 4)			± 1.0		± 0.5		± 0.35	Adc
Leakage Current @ V Load = max. operating voltage	-55°C < T _A < 25°C		± 200		± 200		± 200	nAdc
	25°C < T _A < 120° C		± 20		± 20		± 20	uAdc
Output Voltage Drop			± 0.75		± 1.0		± 2.4	Vdc
Continuous Operating Load Voltage			± 80		± 180		± 350	Vdc
Transient Blocking Voltage (5 S max.)			± 90		± 180		± 360	Vdc
ON Resistance R _{ds} (on) at T _J = 25° C I Load = 100 mAdc (See Fig. 4)			0.4		1.0		7.2	Ohms
Turn-On Time @ I _{in} = 25 mA (See Fig. 2 and 3)			800		600		500	us
Turn-Off Time (See Fig. 2)			500		500		500	us
Load Surge Current (See Note 3)			± 3.5		± 1.75		± 0.875	Adc
dv/dt			100		100		100	V/us
Output Capacitance at 25 Vdc, 1 MHz			325		250		100	pF
DC Offset Voltage			100		100		100	uV
OUTPUT (LOAD) SPECIFICATIONS DC Configuration (Pins 4 and 6 connected together to Pin 5) (See Note 2)		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	UNITS
Continuous Load Current (See Fig. 4)			2.0		1.0		0.5	Adc
Leakage Current @ V Load = max. operating voltage	-55°C < T _A < 25°C		400		400		400	nAdc
	25°C < T _A < 120° C		40		40		40	uAdc
Output Voltage Drop			0.4		0.5		1.8	Vdc
Continuous Operating Load Voltage			80		180		350	Vdc
Transient Blocking Voltage (5 S max.)			90		180		360	Vdc
ON Resistance R _{ds} (on) at T _J = 25° C I Load = 100 mAdc (See Fig. 4)			0.1		0.25		1.8	Ohms
Turn-On Time @ I _{in} = 25 mA (See Fig. 2 and ST 3)			800		800		500	us
Turn-Off Time (See Fig. 3)			500		500		500	us
Load Surge Current (See Note 3)			7.0		3.5		1.75	Adc
dv/dt		100		100		100		V/us
Output Capacitance at 25 Vdc, 1 MHz			650		500		200	pF
OUTPUT (LOAD) SPECIFICATIONS Alt Configurations		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	UNITS
Input to Output Capaitance			5		5		5	pF
Insulation Resistance @ 500 Vdc		10 ⁷		10 ⁷		10 ⁷		Ohms
Dielectric Strength		500		500		500		Vac
Output Junction Temperature @ 1Load = max. rated current		125		125		125		°C
Maximum Junction Temperature T _J (max)			150		150		150	°C
Thermal Resistance Junction to Ambient θ _{JA}			110		110		110	°C/W
Thermal Resistance Junction to Case θ _{JC}			20		20		20	°C/W

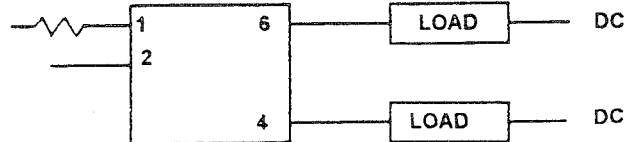
INPUT (CONTROL) CHARACTERISTICS (SEE NOTE 1)		MIN.	TYP.	MAX	UNITS
RATED INPUT CURRENT			25		mA
INPUT VOLTAGE DROP AT 25 mA				3.25	Vdc
Continuous Input	-55°C < T _A < 105°C	10		50	mA
	105°C < T _A < 120°C	10		25	
Reverse Voltage Protection				-5	Vdc
Input Current (Guaranteed On)		10			mA
Input Current (Guaranteed Off)				10	
Turn-Off Voltage				1.5	Vdc

ENVIRONMENTAL SPECIFICATIONS		
Temperature Range	Operating	-55°C +120°C
	Storage	-55°C +125°C
Vibration		100g, 10 to 3000 Hz
Constant Acceleration		5000 g.
Shock		1500 g, 0.5 ms pulse

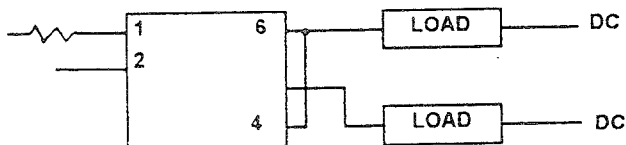
OUTPUT CONFIGURATIONS



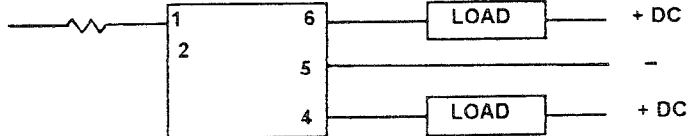
AC OUTPUT VOLTAGE, LOAD CONNECTED TO OUTPUT PINS 4 OR 6



DC OUTPUT VOLTAGE, LOAD CONNECTED TO OUTPUT PINS 4 OR 6



DC OUTPUT VOLTAGE, PARALLELED OUTPUTS
LOAD CONNECTED TO OUTPUT PINS 4 OR 5.



DC OUTPUT VOLTAGE, 2 LOADS SWITCHED TO COMMON PIN 5.

FIG. 1

OUTPUT SWITCHING TIMES

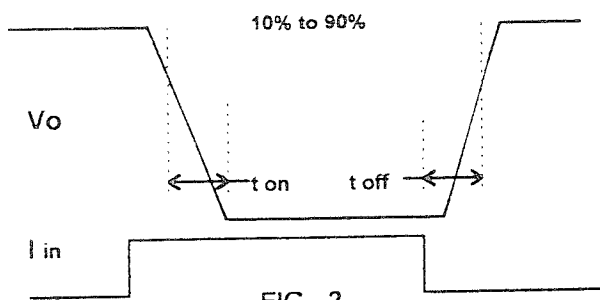


FIG. 2

INPUT CURRENT VS TURN ON TIME

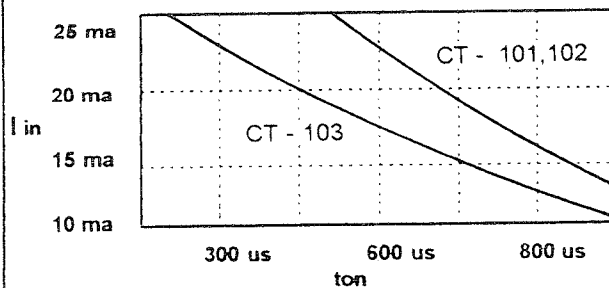


FIG. 3

Series Parallel

LOAD CURRENT VS OPERATING TEMPERATURE

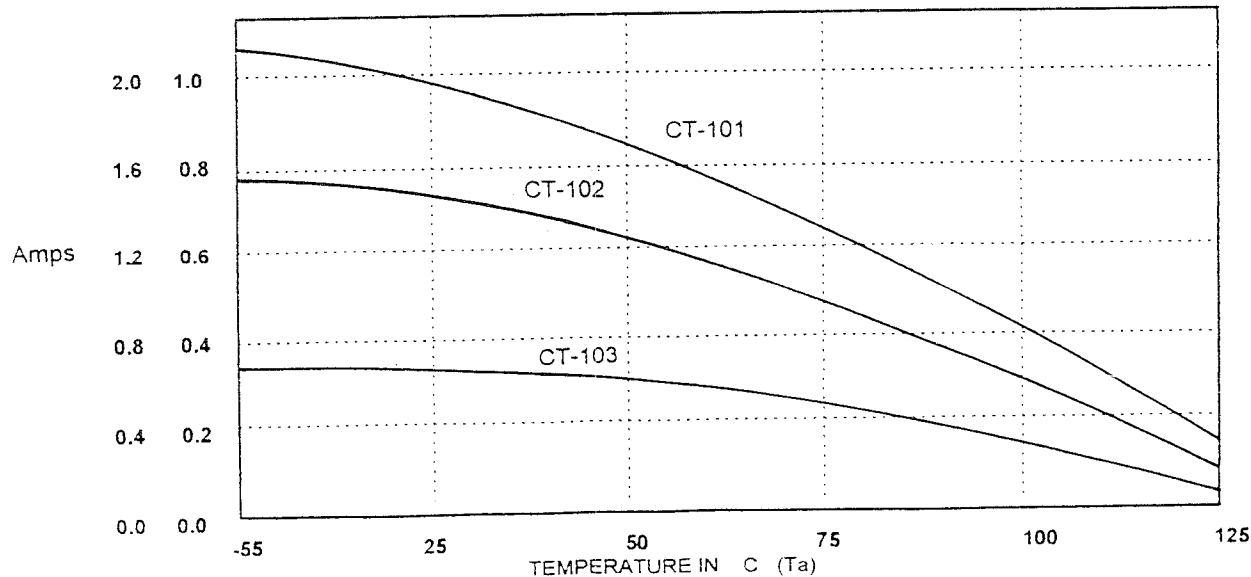
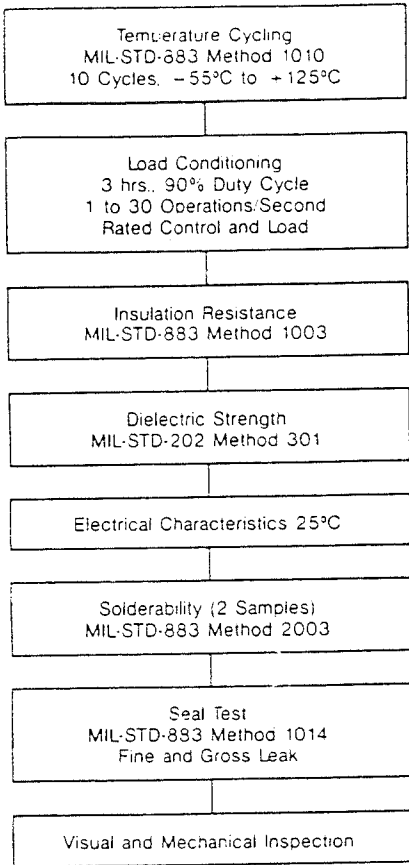
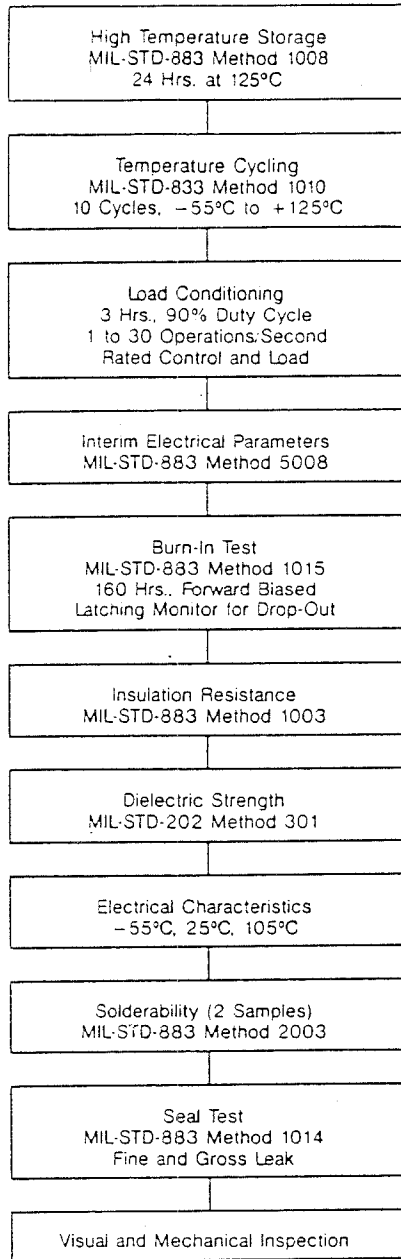


FIG. 4

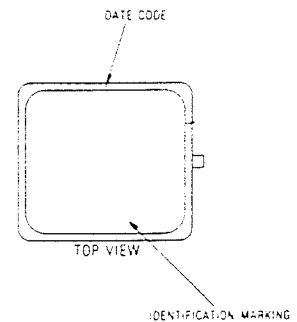
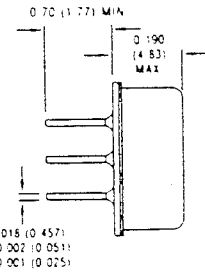
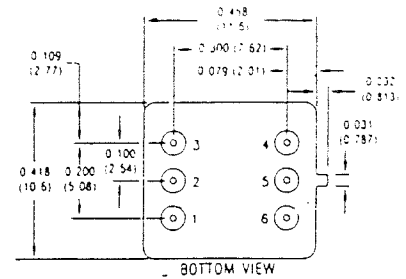
W Level Screen



Y Level Screen



MECHANICAL SPECIFICATIONS



- Weight: 2 gm. (max)
- Case: 6 pin metal DIP hermetically sealed
- Pins: Gold plated per MIL-G-45204 Type III, Grade A, Class 1

NOTES:

1. Series resistor required to limit input current to 50 mA max.
2. The rated input current is 25 mA for all tests unless otherwise specified.
3. Surge current is specified for 25°C, 10 cycles maximum at a 1 Hz repetition rate with 10% duty cycle and 0.1 s. duration.
4. Relays may drive loads connected to either positive or negative referenced power supply lines. Inductive loads must be diode suppressed.
5. ON resistance of each pole is 1/2 of the ON resistance in the bi-directional configuration. Low side switching can only be accommodated in this configuration.
6. Continuous load current is rated under the condition of still air.
7. Maximum leakage current for junction temperatures above 60°C can be determined by this formula:

$$I_L (\text{leak}) \leq 2 \times 10^{(T/30)} \text{ (in nA)}$$