TELEDYNE MICROELECTRONICS
A Teledyne Technologies Company

Series PC605-28XX
10-25A, 28 Vdc
DC Solid-State Power Controller

PART NUMBER*	DESCRIPTION
PC605-2810	10 Amp, 28 Vdc Solid-State Power Controller
PC605-2815	15 Amp, 28 Vdc Solid-State Power Controller
PC605-2825	25 Amp, 28 Vdc Solid-State Power Controller

*The T suffix denotes Teledyne "T" level screening.
The W suffix denotes Teledyne "W" level screening.
The C suffix denotes Teledyne "C" level screening.
See Sheet 5 for detail.

ELECTRICAL SPECIFICATIONS

(-55°C to +105°C Case Temperature, Unless Otherwise Specified)

INPUT (CONTROL) SPECIFICATION

	Min	Typ	Max	Units
Bias Voltage	9	28	32	Vdc
Bias Transient Voltage (1.0 sec)			50	Vpk
Bias Current (ON-State)			20	mAdc
Bias Current (OFF-State)			3	mAdc
Control Voltage Range	-0.5		32	Vdc
Control Current @ Vctrl = 28 Vdc			0.5	mAdc
Control Guaranteed Turn-on Voltage			3.5	Vdc
Control Guaranteed Turn-off Voltage	0.3			Vdc

OUTPUT (LOAD) SPECIFICATION

	Min	Typ	Max	Units
Rated Line Voltage	0	28	50	Vdc
Rated Load Current				
PC605-2810			10.0	Adc
PC605-2815			15.0	Adc
PC605-2825			25.0	Adc
Output Leakage Current @ 28 Vdc			200	µA
Output Voltage Drop @ Rated Current				
PC605-2810			0.20	Vdc
PC605-2815			0.25	Vdc
PC605-2825			0.28	Vdc
On Resistance				
PC605-2810			0.020	Ohms
PC605-2815			0.017	Ohms
PC605-2825			0.011	Ohms
Transient Voltage (1.0 sec)			80.0	VPk
Electrical System Spike MIL-PRF-28750, Z = 80 Ohms PW = 10 uS			±600	Vpk
Capacitive Load @ Rated Load				
PC605-2810			300	µF
PC605-2815			450	µF
PC605-2825			750	µF

FEATURES/BENEFITS

- Temperature-independent current rating and overload protection
- Surge-tolerant short-circuit protection
- Optical isolation - complies with MIL-STD-461 EMI emission requirements
- I^2t protection meets MIL-STD-1760 requirements
- Low On-resistance
- Trip and load voltage status
- Meets surge and spike requirements of MIL-STD-704A
- Contact factory for ROHS compliance

DESCRIPTION

The PC605 Series are true COTS, non-hermetic Solid State Power Controllers (SSPCs) designed for use in Power Management and Power Distribution applications.

Utilizing the latest technology, the PC605 provides low ON Resistance with complete short circuit and overload current protection. In addition, status output lines are provided for trip condition and load voltage to enable load monitoring and BIT (built-in-test) features.

SSPCs are electronic replacements for conventional electro-mechanical load relays and circuit breakers. By combining load switching and circuit protection into one device.

SSPCs provide a complete remote switching package, reduce component count, system weight & cost, and increase system flexibility and reliability.

OUTPUT (LOAD) SPECIFICATION (cont.)

	Min	Typ	Max	Units
Turn-On Time			1.0	mSec
Turn-Off Time			1.0	mSec
Trip Point @ 150% of Rated Current	0.50			Sec
Trip Point @ 250% of Rated Current	0.26		1.0	Sec
Trip Point @ Upper Limit Must Not Trip (600%)	0.08		0.30	Sec
Trip Reset Time			50	mSec
Line Voltage dv/dt, Per MIL-PRF-28750			100	V/µS
Thermal Resistance Junction-to-Base Plate			0.30	°C/W
Thermal Resistance Junction-to-Ambient			15	°C/W
Dielectric Withstanding Voltage Input to Output, All Pins-to-Base Plate			750	Vac
Insulation Resistance Input to Output, All Pins-to-Base Plate			10^8	Ohm

STATUS SPECIFICATION

(open-collector configuration)

	Min	Typ	Max	Units
Status Line Voltage	0	28	32	Vdc
Status Blocking Voltage			50	Vpk
Status Leakage Current @ 28 Vdc			10	µA
Status Output High (2.8K pull-up resistor)		Vbias - 0.1		Vdc
Status Output Low (10 mA sink current)			0.7	Vdc
Load Status Timing V=28 VDC, R(pull-up) = 2.8K				
Load Status Turn-On Time			3.0	mS
Load Status Turn-Off Time			3.0	mS
Trip Status Timing V=28 VDC, R(pull-up) = 2.8K				
Trip Status Turn-On Time			1.0	mS
Trip Status Turn-Off Time			3.0	mS

ENVIRONMENTAL SPECIFICATION

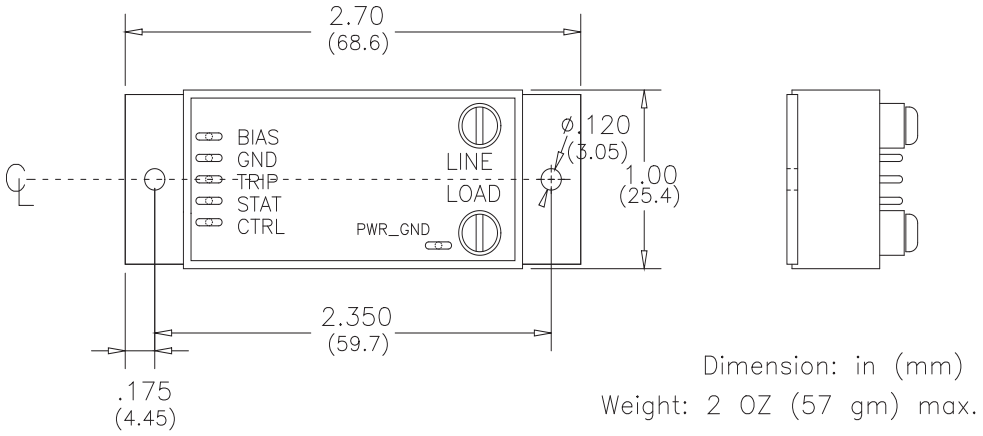
	Min	Typ	Max	Units
Operating Temperature	-55		105	°C
Storage Temperature	-55		125	°C
Moisture Resistance (HAST Test) 85% Relative Humidity, 93°C temperature at 96 hours - Passed				
Life Test 1000 Hours @ 120°C - Passed				

SSPC APPLICATION NOTES:

The device operates as described in the following paragraphs. Refer to FIGURE 2 for the block diagram.

- BIAS VOLTAGE. The bias voltage provides the power to energize the SSPC. Opening the Bias Voltage will default the SSPC output to an Off-state. Never supply bias voltage below the minimum voltage requirement
- The CONTROL INPUT. The device is commanded ON, OFF and RESET by a control signal at the CONTROL pin. A HIGH signal will turn the device ON. A LOW signal or an OPEN condition will turn the device OFF. If the device trips OFF, the device is reset by cycling the CONTROL to OFF then ON with a pulse width of greater than 50 mSec.
- LOAD STATUS. The Load Status is in an open collector configuration. With a pull-up resistor, a LOW level at the LOAD STATUS output indicates that the device is ON and the output (load) voltage is present. A HIGH level at the LOAD STATUS output indicates that the device is OFF and the output (load) voltage is not present.
- TRIP STATUS. The Trip Status is in an open collector configuration. With a pull-up resistor, a LOW level at the TRIP STATUS output indicates that the device has tripped due to an overcurrent condition. TRIP STATUS output is at HIGH level during normal operation. A TRIP STATUS will change to LOW in response to an overcurrent trip. TRIP STATUS will remain LOW until the overcurrent condition has cleared and the device is reset.
- POWER GROUND. In order to have proper Load Status operation, the Power Ground terminal must be connected to the line voltage RETURN with impedance of no more than 100 ohms.
- Overcurrent operation. The device will trip (i.e., turn off) if the load current exceeds the requirement of FIGURE 3. Once the device is tripped, it will remain OFF indefinitely, until the overcurrent condition has cleared and the device is reset.
- Unless otherwise noted, all tests shall be performed with V(bias) = 28 Vdc, V(status) = 28 Vdc, V(line) = 28 Vdc, R(status) = 2.8K, I(load = Rated Current.
- The transition time for the control signal shall be less than 0.1 mSec in application.
- Inductive loads must be diode suppressed. System series inductance in the short circuit mode shall be less than 30 µH.

FIGURE 1 - MECHANICAL OUTLINE



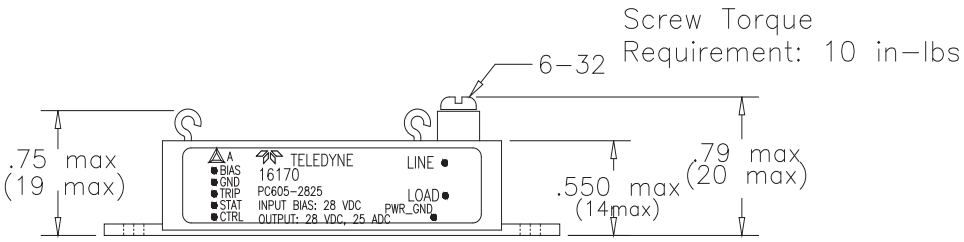


FIGURE 2 - FUNCTIONAL BLOCK DIAGRAM

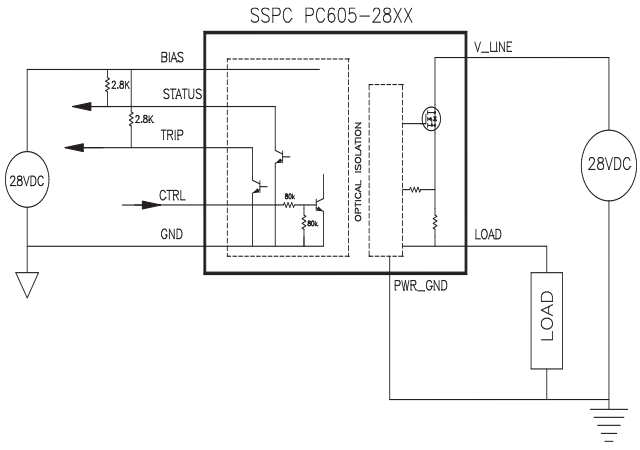


FIGURE 3 - OVER CURRENT TRIP CURVE

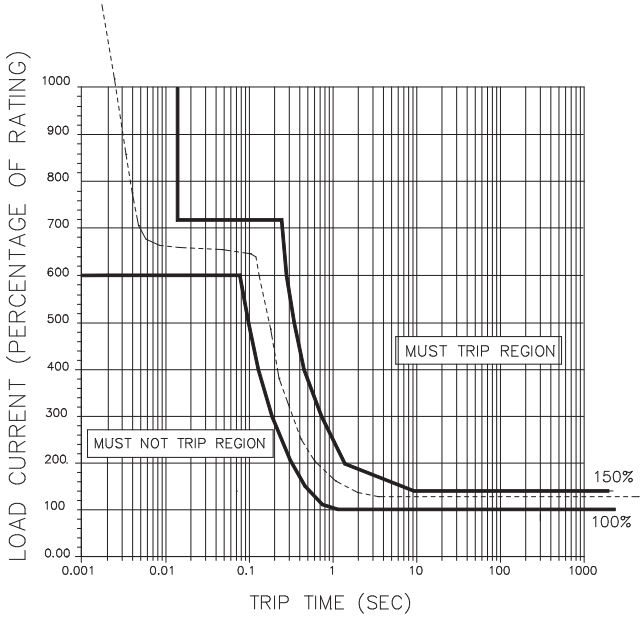


FIGURE 4 - TIMING WAVE FORMS

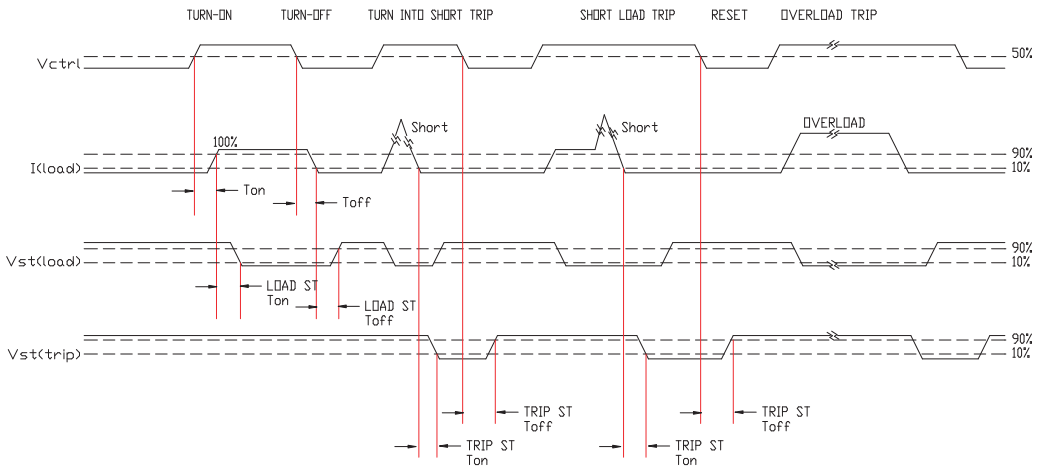
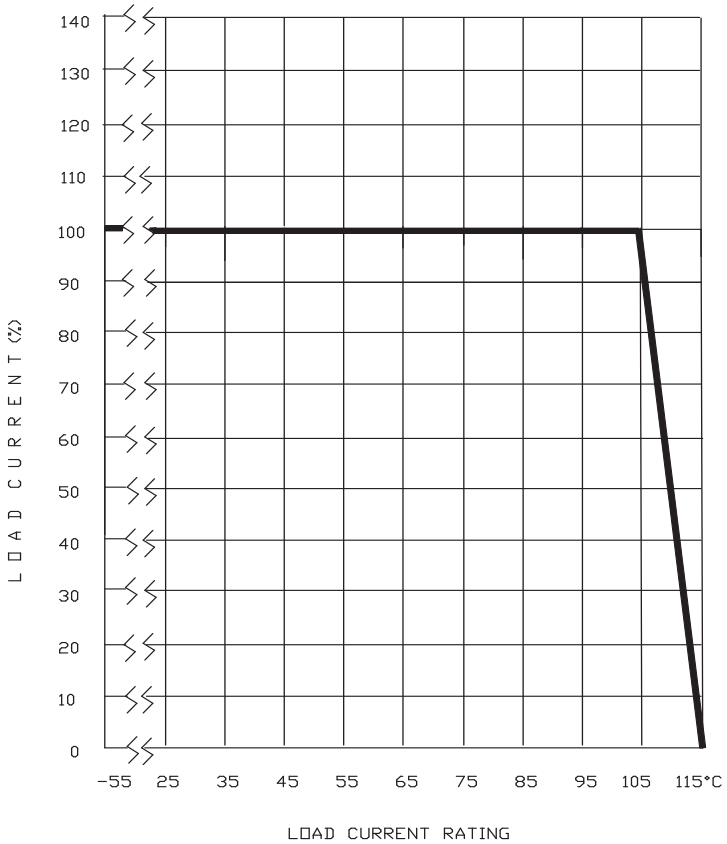


FIGURE 5 - LOAD CURRENT RATING



QUALITY CONFORMANCE INSPECTION PLASTIC ENCAPSULATED SSPC

All tests are 100% unless otherwise noted.

Level C Screening

- Internal Visual
- Temperature Cycling
  MIL-STD-883 Method 1010
  10 cycles over specified temperature range
- Dielectric Withstanding Voltage (Sample tested)
  MIL-STD-883 Method 301
- Insulation Resistance (Sample tested)
  MIL-STD-883 Method 1003
- Electrical Characteristics @ +25°C
- Visual/Mechanical

Level W Screening

- Internal Visual
- Temperature Cycling
  MIL-STD-883 Method 1010
  10 cycles over specified temperature range
- Load Conditioning
  3 hours at rated input and load
  90% duty cycle, 1 to 30 operations per second (latching fault indication for dropout)
- Dielectric Withstanding Voltage
  MIL-STD-883 Method 301
- Insulation Resistance
  MIL-STD-883 Method 1003
- Electrical Characteristics at +25°C
- Visual/Mechanical

Level T Screening

- Internal Visual
- Temperature Cycling
  MIL-STD-883 Method 1010
  10 cycles over specified temperature range
- Load Conditioning
  3 hours at rated input and load
  90% duty cycle, 1 to 30 operations per second (latching fault indication for dropout)
- Burn in Test
  MIL-STD-883 Method 1015
  48 hours for plastic packaged microcircuits at specified temperature, rated input, load voltage and current (latching fault indication on failure)
- Dielectric Withstanding Voltage
  MIL-STD-883 Method 301
- Insulation Resistance
  MIL-STD-883 Method 1003
- Electrical Characteristics at -55°C
- Electrical Characteristics at +25°C
- Electrical Characteristics at +125°C, (or as specified)
- Visual/Mechanical
- Solderability (2 samples), MIL-STD-202 Method 208