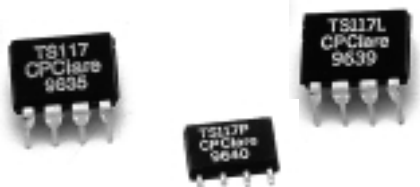




MULTIFUNCTION TELECOM SWITCH

TS117/TS117L



DESCRIPTION

TS117 is a 350V, 120mA, 35Ω 1-Form-A relay with an optocoupler in a single package. It provides high sensitivity and is an ideal solution for many telecom applications. Current limiting version is available ("L" suffix).

FEATURES

- Small 8 Pin DIP Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- 3750V_{RMS} Input/Output Isolation
- FCC Compatible
- VDE Compatible
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Surface Mount and Tape & Reel Versions Available

APPLICATIONS

- Telecommunications
 - Telecom Switching
 - Tip/Ring Circuits
 - Modem Switching (Laptop, Notebook, Pocket Size)
 - Hookswitch
 - Dial Pulsing
 - Ground Start
 - Ringer Injection
- Instrumentation
 - Multiplexers
 - Data Acquisition
 - Electronic Switching
 - I/O Subsystems
 - Meters (Watt-Hour, Water, Gas)
- Medical Equipment-Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

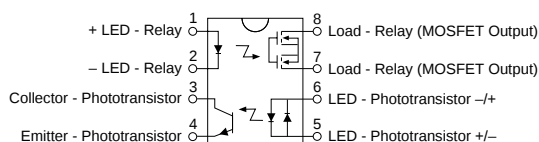
APPROVALS

- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-10
- BSI Certified:
 - BS EN 60950:1992 (BS7002:1992) Certificate #:7344
 - BS EN 41003:1993 Certificate #:7344

OPTIONS / SUFFIXES

- P: Flatpack Package
- L: Current Limiting
- S: Surface Mount Package
- TR: Tape & Reel

TS117/TS117L Pinout



RATINGS (@ 25° C)

Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150 ¹	mW
Input Control Current	-	-	50	mA
Peak (10ms)	-	-	1	A
Reverse Input Voltage	-	-	5	V
Total Power Dissipation	-	-	800 ²	mW
Capacitance				
Input to Output	-	3	-	pF
Isolation Voltage				
Input to Output	3750	-	-	V _{RMS}
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature				
DIP Package	-	-	+260	°C
Flatpack/Surface Mount Package	-	-	+220	°C
(10 Seconds Max.)				

¹ Derate Linearly 1.33 mW/°C

² Derate Linearly 6.67 mW/°C

Note: For Mechanical Dimensions See Pages 408-415



MULTIFUNCTION TELECOM SWITCH

TS117/TS117L

SPECIFICATIONS

TS117						TS117L			
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	MIN	TYP	MAX	UNITS
Relay Portion (Pins 7, 8) Output Characteristics @ 25°C									
Load Voltage (Peak)	-	V _L	-	-	350	-	-	350	V
Load Current (Continuous)	-	I _L	-	-	120	-	-	120	mA
Peak Load Current	10ms	I _{LPK}	-	-	350	-	-	-	mA
On-Resistance	I _L =120mA	R _{ON}	-	23	35	-	30	35	Ω
Off-State Leakage Current	V _L =350V	I _{LEAK}	-	-	1	-	-	1	μA
Switching Speeds	I _F =5mA, V _I =10V I _F =5mA, V _L =10V	T _{ON}	-	-	3.0	-	-	3.0	ms
Turn-On		T _{OFF}	-	-	3.0	-	-	3.0	ms
Turn-Off									
Output Capacitance	50V; f=1MHz	C _{OUT}	-	25	-	-	25	-	pF
Load Current Limit		I _{CL}	-	-	-	130	170	210	mA
Relay Portion (Pins 1, 2) Input Characteristics @ 25°C									
Input Control Current	I _L =120mA	I _F	2	-	50	2	-	50	mA
Input Dropout Current	-	I _F	0.4	0.7	-	0.4	0.7	-	mA
Input Voltage Drop	I _F =5mA	V _F	0.9	1.2	1.4	0.9	1.2	1.4	V
Reverse Input Voltage	-	V _R	-	-	5	-	-	5	V
Reverse Input Current	V _R =5V	I _R	-	-	10	-	-	10	μA
Detector Portion (Pins 3,4) Output Characteristics @ 25°C									
Phototransistor Blocking Voltage	I _C =10μA	BV _{CEO}	20	50	-	20	50	-	V
Phototransistor Output Current	V _{CE} =5V, I _F =0mA	I _{CEO}	-	50	500	-	50	500	nA
Saturation Voltage	I _C =2mA, I _F =16mA	V _{SAT}	-	0.3	0.5	-	0.3	0.5	V
Current Transfer Ratio	I _F =6mA, V _{CE} =0.5V	CTR	33	100	-	33	100	-	%
Detector Portion (Pins 5,6) Input Characteristics @ 25°C									
Input Control Current	I _C =2mA, V _{CE} =0.5V	I _F	6	2	100	6	2	100	mA
Input Voltage Drop	I _F =5mA	V _F	0.9	1.2	1.4	0.9	1.2	1.4	V
Input Current (Detector must be off)	I _C =1μA, V _{CE} =5V	I _F	5	25	-	5	25	-	μA
Input to Output Capacitance (Relay Only)	-	C _{I/O}	-	3	-	-	3	-	pF
Input to Output Isolation	-	V _{I/O}	3750	-	-	3750	-	-	V _{RMS}

Note: For Mechanical Dimensions See Pages 408-415

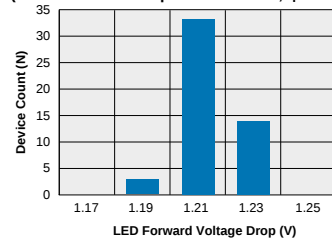
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MULTIFUNCTION TELECOM SWITCH

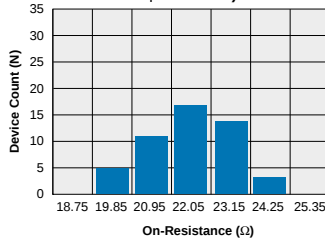
TS117/TS117L

PERFORMANCE DATA

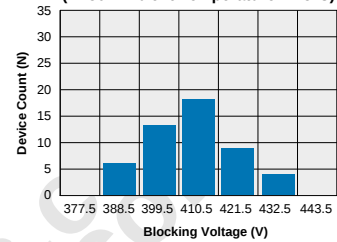
TS117
Typical LED Forward Voltage Drop
(N=50 Ambient Temperature = 25°C; $I_F = 5\text{mA}$)



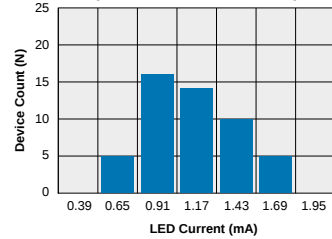
TS117
Typical On-Resistance Distribution
(N=50 Ambient Temperature = 25°C)
(Load: Voltage = 350VDC; Current = 120mADC;
 $I_F = 2\text{mA}$)



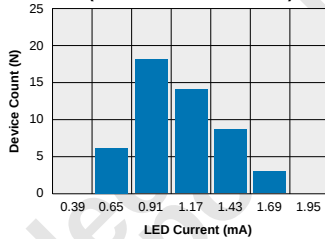
TS117
Typical Blocking Voltage Distribution
(N=50 Ambient Temperature = 25°C)



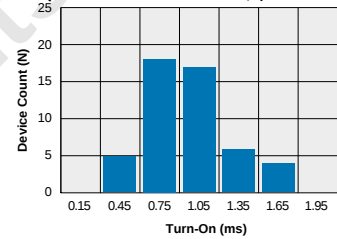
TS117
Typical I_F for Switch Operation
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mADC)



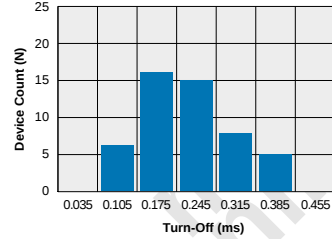
TS117
Typical I_F for Switch Dropout
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mADC)



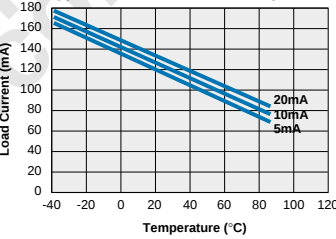
TS117
Typical Turn-On Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mADC; $I_F = 2\text{mA}$)



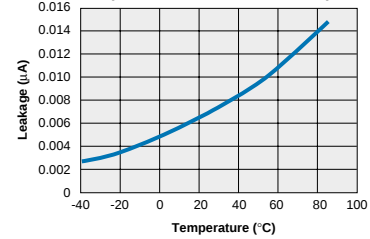
TS117
Typical Turn-Off Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mADC; $I_F = 2\text{mA}$)



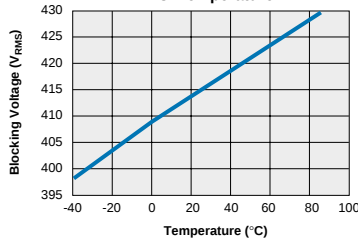
TS117
Typical Load Current vs. Temperature



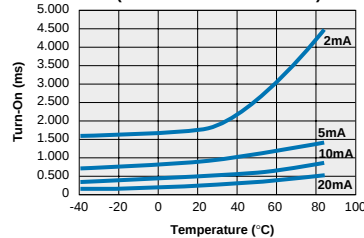
TS117
Typical Leakage vs. Temperature
(Measured across Pins 7 & 8)



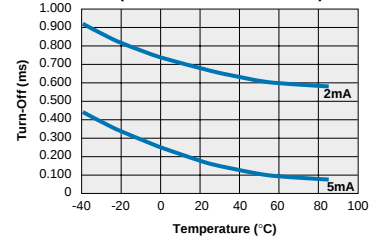
TS117
Typical Blocking Voltage vs. Temperature



TS117
Typical Turn-On vs. Temperature
(Load Current = 120mADC)



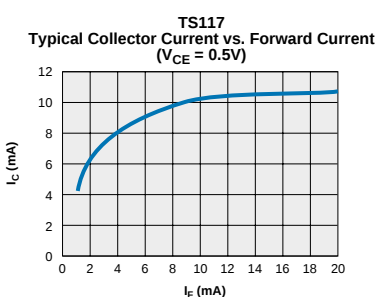
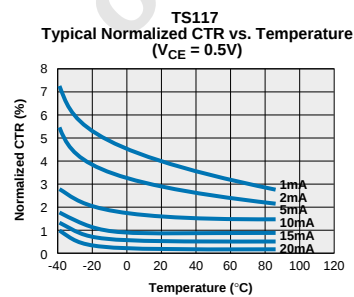
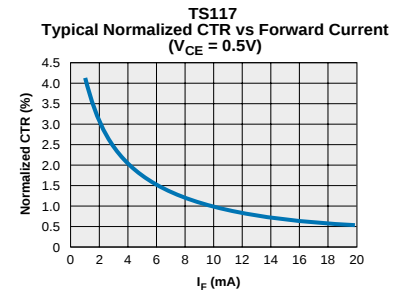
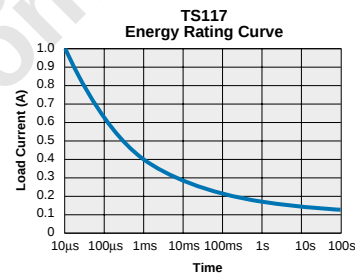
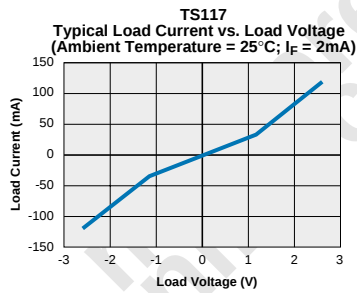
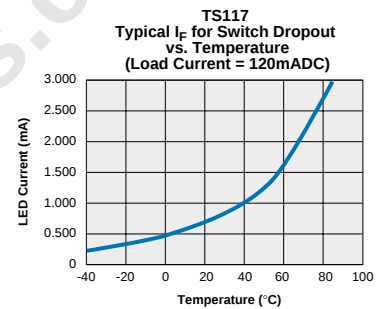
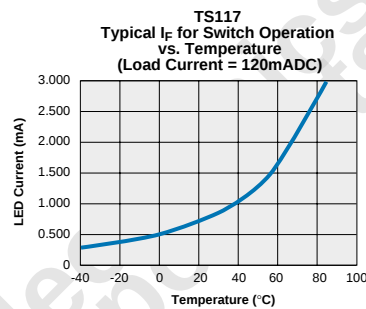
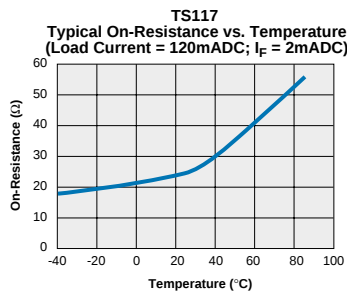
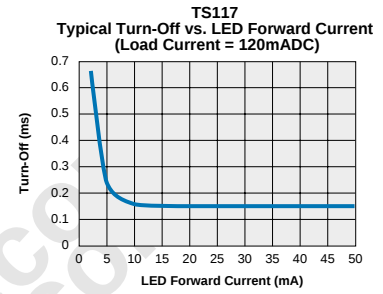
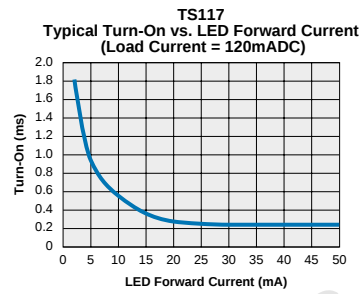
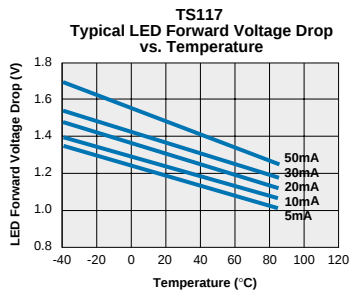
TS117
Typical Turn-Off vs. Temperature
(Load Current = 120mADC)



MULTIFUNCTION TELECOM SWITCH

TS117/TS117L

PERFORMANCE DATA

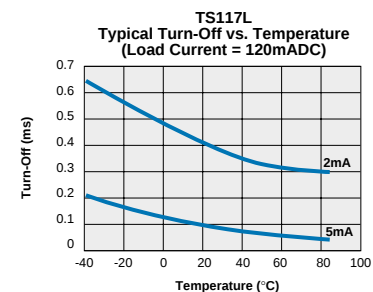
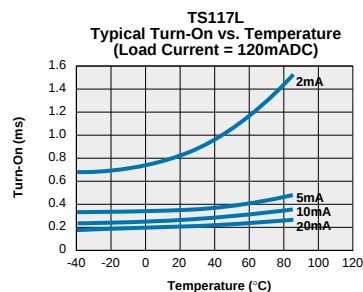
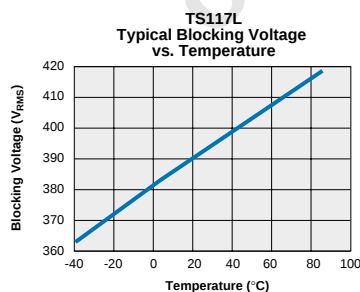
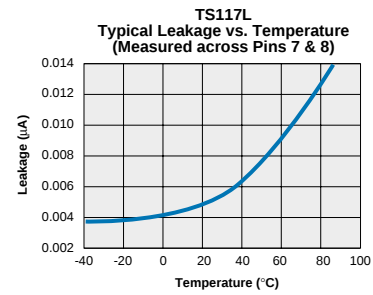
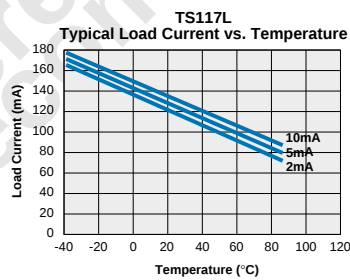
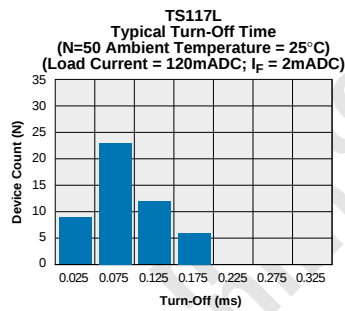
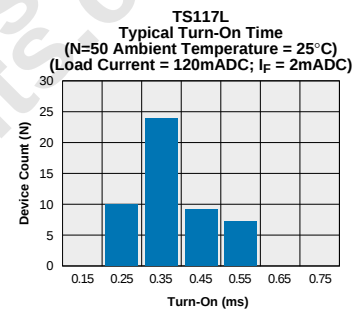
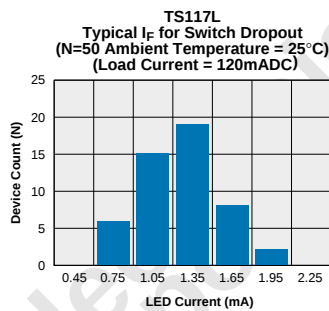
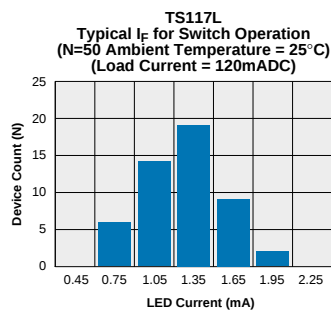
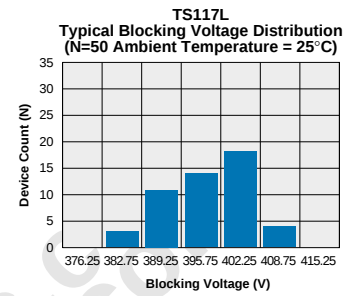
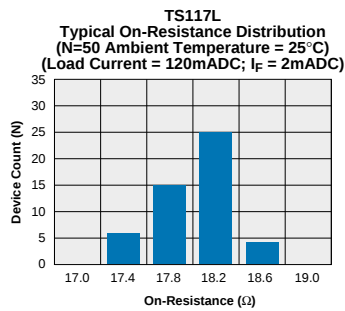
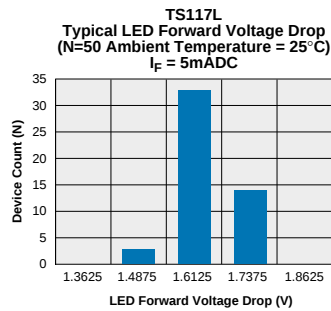




MULTIFUNCTION TELECOM SWITCH

TS117/TS117L

PERFORMANCE DATA





MULTIFUNCTION TELECOM SWITCH

TS117/TS117L

PERFORMANCE DATA

