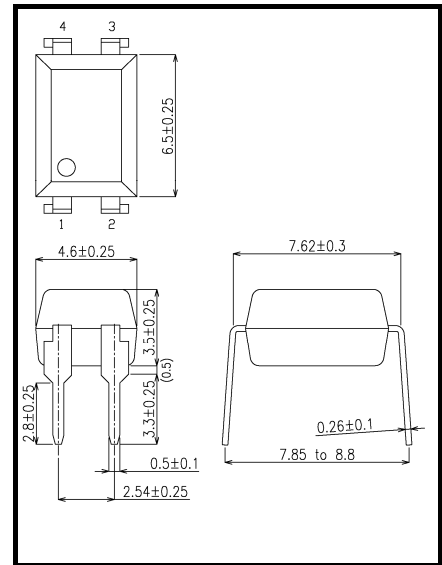


- Office Equipment
- Household Appliances
- Solid State Relays
- Switching Power Supplies
- Various Controllers
- Signal Transmission Between Different Voltage Circuits

The TLP785 consists of a silicone phototransistor optically coupled to a gallium arsenide (GaAs) infrared emitting diode in a four lead plastic DIP (DIP4) with having high isolation voltage (AC: 5kV_{RMS} (min)).

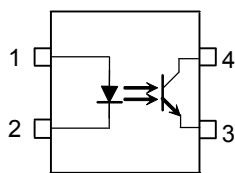
TLP785 Unit: mm



Weight: 0.32 g (typ.)

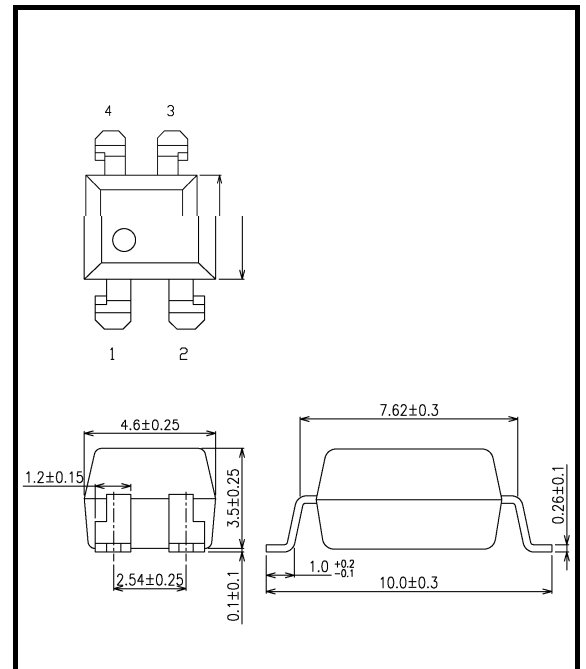
- Collector-emitter voltage: 80V (min.)
- Current transfer ratio: 50% (min.)
Rank GB: 100% (min.)
- Isolation voltage: 5000V_{rms} (min.)
- UL approved: UL1577, file No. E492440

Pin Configurations (top view)



- 1 : Anode
- 2 : Cathode
- 3 : Emitter
- 4 : Collector

TLP785 Unit: mm



Weight: 0.31g (typ.)

Current Transfer Ratio

Type	Classification (Note 1)	Current Transfer Ratio (%) (I_C / I_F)		Marking of Classification
		$I_F = 5\text{mA}, V_{CE} = 5\text{V}, T_a = 25^\circ\text{C}$		
		Min	Max	
TLP785	None	50	600	Blank
	Rank Y	50	150	YE
	Rank GR	100	300	GR
	Rank BL	200	600	BL
	Rank GB	100	600	GB
	Rank YH	75	150	Y+
	Rank GRL	100	200	G
	Rank GRH	150	300	G+
	Rank BLL	200	400	B

(Note 1): Ex. rank GB: TLP785 (GB)

(Note 2): Application type name for certification test, please use standard product type name, i. e. TLP785 (GB): TLP785

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristic		Symbol	Rating	Unit
LED	Forward current	I_F	60	mA
	Forward current derating ($T_a \geq 39^\circ\text{C}$)	$\Delta I_F / ^\circ\text{C}$	-0.7	mA / $^\circ\text{C}$
	Pulse forward current (Note 3)	I_{FP}	1	A
	Power dissipation	P_D	100	mW
	Power dissipation derating	$\Delta P_D / ^\circ\text{C}$	-0.9	mW / $^\circ\text{C}$
	Reverse voltage	V_R	5	V
	Junction temperature	T_j	125	$^\circ\text{C}$
Detector	Collector-emitter voltage	V_{CEO}	80	V
	Emitter-collector voltage	V_{ECO}	7	V
	Collector current	I_C	80	mA
	Power dissipation (single circuit)	P_C	150	mW
	Power dissipation derating ($T_a \geq 25^\circ\text{C}$)	$\Delta P_C / ^\circ\text{C}$	-1.5	mW / $^\circ\text{C}$
	Junction temperature	T_j	125	$^\circ\text{C}$
Operating temperature range		T_{opr}	-55 to 110	$^\circ\text{C}$
Storage temperature range		T_{stg}	-55 to 125	$^\circ\text{C}$
Lead soldering temperature (10s)		T_{sol}	260	$^\circ\text{C}$
Total package power dissipation		P_T	200	mW
Total package power dissipation derating ($T_a \geq 25^\circ\text{C}$)		$\Delta P_T / ^\circ\text{C}$	-2.4	mW / $^\circ\text{C}$
Isolation voltage (Note 4)		BV_S	5000	V_{rms}

(Note 3): 100 μs pulse, 100 Hz frequency

(Note 4): AC, 1 min., R.H. \leq 60%. Apply voltage to LED pin and detector pin together.

Recommended Operating Conditions (Note)

Characteristic	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{CC}	—	5	24	V
Forward current	I_F	—	16	25	mA
Collector current	I_C	—	1	10	mA
Operating temperature	T_{opr}	-25	—	85	°C

(Note): Recommended operating conditions are given as a design guideline to obtain expected performance of the device.
 Additionally, each item is an independent guideline respectively.
 In developing designs using this product, please confirm specified characteristics shown in this document.

Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	V_F	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5 \text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0\text{V}, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Collector-emitter breakdown voltage	$V_{(BR) CEO}$	$I_C = 0.5 \text{ mA}$	80	—	—	V
	Emitter-collector breakdown voltage	$V_{(BR) ECO}$	$I_E = 0.1 \text{ mA}$	7	—	—	V
	Collector dark current	$I_D(I_{CEO})$	$V_{CE} = 24 \text{ V}$	—	0.01	0.1	μA
			$V_{CE} = 24 \text{ V}, T_a = 85^\circ\text{C}$	—	0.6	50	μA
Capacitance (collector to emitter)	C_{CE}	$V = 0\text{V}, f = 1 \text{ MHz}$	—	6	—	pF	

Coupled Electrical Characteristics (Ta = 25°C)

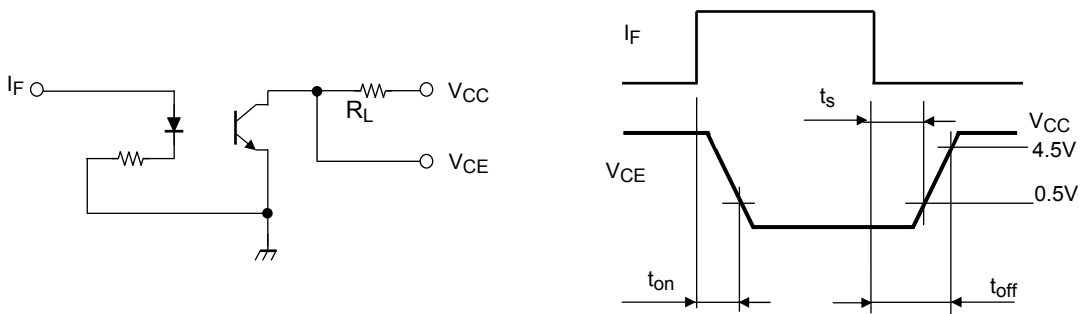
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Current transfer ratio	I_C / I_F	$I_F = 5 \text{ mA}, V_{CE} = 5 \text{ V}$ Rank GB	50	—	600	%
			100	—	600	
Saturated CTR	$I_C / I_F (\text{sat})$	$I_F = 1 \text{ mA}, V_{CE} = 0.4 \text{ V}$ Rank GB	—	60	—	%
			30	—	—	
Collector-emitter saturation voltage	$V_{CE} (\text{sat})$	$I_C = 2.4 \text{ mA}, I_F = 8 \text{ mA}$ $I_C = 0.2 \text{ mA}, I_F = 1 \text{ mA}$ Rank GB	—	—	0.4	V
			—	0.2	—	
		—	—	0.4		

Isolation Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance (input to output)	C_S	$V_S = 0\text{V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}$	1×10^{12}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	5000	—	—	V_{rms}
		AC, 1 second, in oil	—	10000	—	
		DC, 1 minute, in oil	—	10000	—	Vdc

Switching Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Rise time	t_r	$V_{CC} = 10\text{ V}, I_C = 2\text{ mA}$ $R_L = 100\Omega$	—	2	—	μs
Fall time	t_f		—	3	—	
Turn-on time	t_{on}		—	3	—	
Turn-off time	t_{off}		—	3	—	
Turn-on time	t_{on}	$R_L = 1.9\text{ k}\Omega$ (fig. 1) $V_{CC} = 5\text{ V}, I_F = 16\text{ mA}$	—	1.5	—	μs
Storage time	t_s		—	25	—	
Turn-off time	t_{off}		—	50	—	

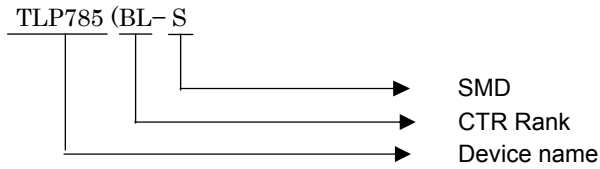


(fig. 1): Switching time test circuit

1. Product Naming System

Type of package used for shipment is denoted by a symbol suffix after a product number. The method of classification is as below.

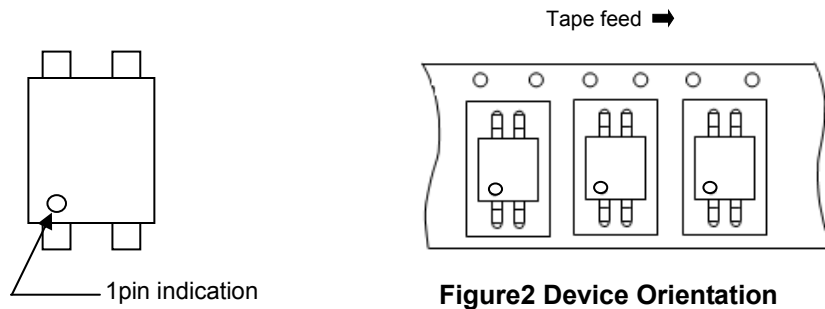
(Example)



2. Tape Dimensions

2.1 Orientation of Device in Relation to Direction of Tape Movement

Device orientation in the recesses is as shown in Figure 2.



2.2 Tape Packing Quantity:2000 devices per reel

