

Preliminary

TLP719

DIGITAL LOGIC GROUND ISOLATION.

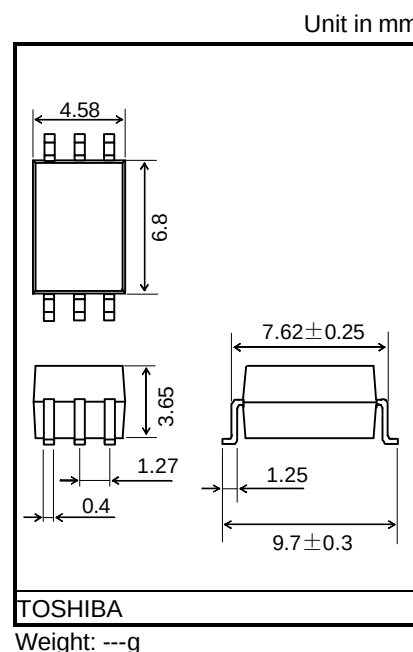
LINE RECEIVER.

MICROPROCESSOR SYSTEM INTERFACES.

SWITCHING POWER SUPPLY FEEDBACK CONTROL.

TRANSISTOR INVERTOR.

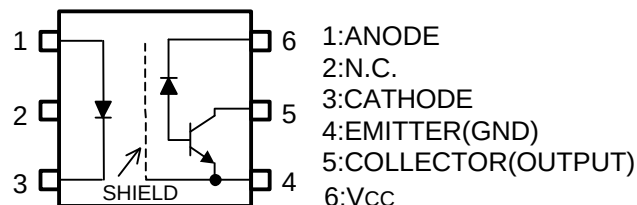
The TOSHIBA TLP719 consists of a GaAlAs high-output light emitting diode and a high speed detector. This unit is 6-lead SDIP. TLP719 is 50% smaller than 8PIN DIP and has suited the safety standard reinforced insulation class. So mounting area in safety standard required equipment can be reduced. TLP719 has a Faraday shield integrated on the photodetector chip provides an effective common mode noise transient immunity. So this is suitable for application in noisy environmental condition.



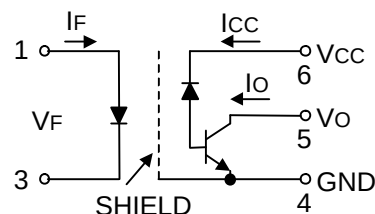
- Open Collector
- Package Type : SDIP6
- Isolation voltage : 5000 Vrms (Min.)
- Common mode Transient Immunity : $\pm 10\text{kV}/\mu\text{s}$ (Min.) @VCM=400V
- Switching speed : $t_{\text{pHL}} = 0.8\mu\text{s}$, $t_{\text{pLH}} = 0.8\mu\text{s}$ (Max.)
@ $I_F = 16\text{mA}$, $V_{\text{CC}} = 5\text{V}$,
 $R_L = 1.9\text{k}\Omega$, $T_a = 25^\circ\text{C}$
- TTL Compatible
- Construction Mechanical Rating

	7.62 mm pich standard type	10.16 mm pich TLPXXXF type
Creepage Distance	7.0 mm (Min)	8.0 mm (Min)
Clearance	7.0 mm (Min)	8.0 mm (Min)
Insulation Thickness	0.4 mm (Min)	0.4 mm (Min)

PIN CONFIGURATION (Top view)



SCHEMATIC



A $0.1\mu\text{F}$ bypass capacitor must be connected between pins 4 and 6.

Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current (Note 1)	I _F	25	mA
	Pulse forward current (Note 2)	I _{FP}	50	mA
	Peak transient forward current (Note 3)	I _{FPT}	1	A
	Reverse voltage	V _R	5	V
	Diode power dissipation (Note 4)	P _D	45	mW
	Junction Temperature	T _j	125	°C
Detector	Output current	I _O	8	mA
	Peak output current	I _{OP}	16	mA
	Output voltage	V _O	−0.5~20	V
	Supply voltage	V _{CC}	−0.5~30	V
	Output power dissipation (Note 5)	P _O	100	mW
	Junction Temperature	T _j	125	°C
Operating temperature range		T _{opr}	−55~100	°C
Storage temperature range		T _{opr}	−55~125	°C
Lead solder temperature (10s)		T _{sol}	260	°C
Isolation voltage (AC, 1min., R.H.= 60%) (Note 6)		BV _S	5000	V _{rms}

(Note 1) Derate 0.45mA / °C above 70°C.

(Note 2) 50% duty cycle, 1ms pulse width.
Derate 0.9mA / °C above 70°C.

(Note 3) Pulse width = 1μs, 300pps.

(Note 4) Derate 0.8mW / °C above 70°C.

(Note 5) Derate 1.8mW / °C above 70°C.

(Note 6) Device considered a two terminal device: Pins 1, 2 and 3 shorted together and pins 4, 5 and 6 shorted together.

Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	$I_F = 16\text{mA}$		1.65	1.85	V
	Forward voltage Temperature coefficient	$? V_F / ? T_a$	$I_F = 16\text{mA}$	?	-2	?	mV / °C
	Reverse current	I_R	$V_R = 5\text{V}$	?	?	10	μA
	Capacitance between terminal	C_T	$V_F = 0\text{V}$, $f = 1\text{MHz}$	?	45	?	pF
Detector	High level output current	$I_{OH(1)}$	$I_F = 0\text{mA}$, $V_{CC} = V_O = 5.5\text{V}$	?	3	500	nA
		$I_{OH(2)}$	$I_F = 0\text{mA}$, $V_{CC} = 30\text{V}$ $V_O = 20\text{V}$	?	?	5	μA
		I_{OH}	$I_F = 0\text{mA}$, $V_{CC} = 30\text{V}$ $V_O = 20\text{V}$, $T_a = 70^\circ\text{C}$	?	?	50	
	High level supply voltage	I_{CCH}	$I_F = 0\text{mA}$, $V_{CC} = 30\text{V}$	?	0.01	1	μA
	Supply voltage	V_{CC}	$I_{CC} = 0.01\text{mA}$	30	?	?	V
	Output voltage	V_O	$I_O = 0.5\text{mA}$	20	?	?	V

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Current transfer ratio	I_O / I_F	$I_F = 16\text{mA}$, $V_{CC} = 4.5\text{V}$ $V_O = 0.4\text{V}$	20	?	?	%
Low level output voltage	V_{OL}	$I_F = 16\text{mA}$, $V_{CC} = 4.5\text{V}$ $I_O = 2.4\text{mA}$	?	?	0.4	V

Isolation Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C_S	$V = 0\text{V}$, $f = 1\text{MHz}$ (Note 6)	?	0.8	?	pF
Isolation resistance	R_S	R.H. = 60%, $V_S = 500\text{V}$ (Note 6)	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, Vcc = 5V)

Characteristic	Symbol	Test Circuit	Test Condition	Min.	Typ.	Max.	Unit
Propagation delay time (H? L)	t_{pHL}	Fig1	$I_F = 0? 16mA$ $R_L = 1.9k\Omega$	?	?	0.8	μs
Propagation delay time (L? H)	t_{pLH}		$I_F = 16? 0mA$ $R_L = 1.9k\Omega$	?	?	0.8	μs
Common mode transient immunity at logic high output (Note 7)	CM_H	Fig2	$I_F = 0mA$, $V_{CM} = 400V_{p-p}$ $R_L = 1.9k\Omega$	10000	?	?	$V / \mu s$
Common mode transient immunity at logic low output (Note 7)	CM_L		$I_F = 16mA$, $V_{CM} = 400V_{p-p}$ $R_L = 1.9k\Omega$	-10000	?	?	$V / \mu s$

(Note 7) : CM_L is the maximum rate of fall of the common mode voltage that can be sustained with the output voltage in the logic low state($V_O < 0.8V$).
 CM_H is the maximum rate of rise of the common mode voltage that can be sustained with the output voltage in the logic high state($V_O > 2V$).

Fig 1. Switching Time Test Circuit

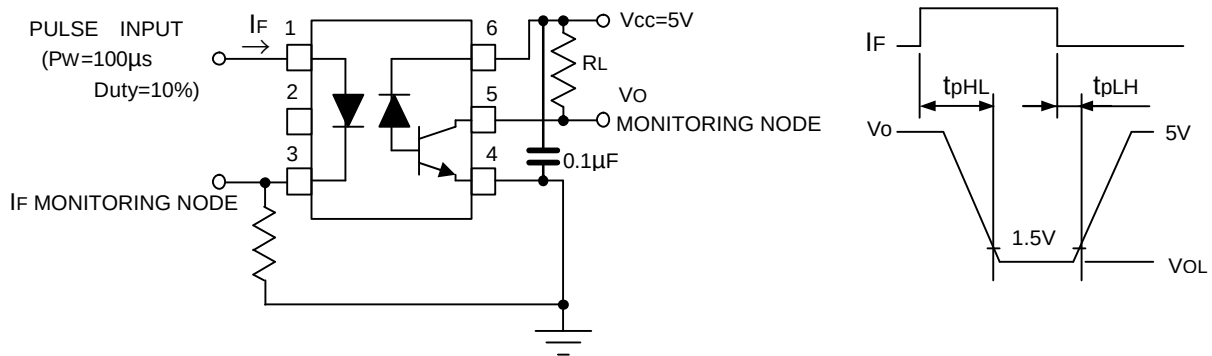
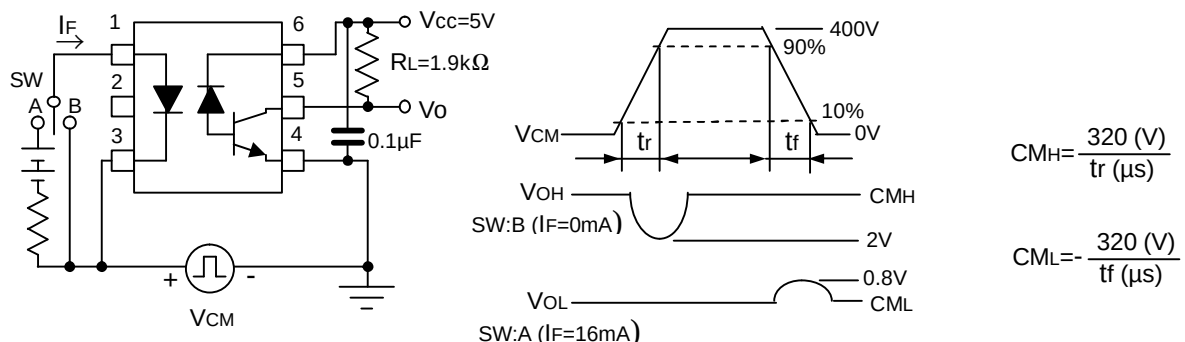


Fig 2. Common Mode Noise Immunity Test Circuit.



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