

TOSHIBA PHOTOCOUPLER PHOTO RELAY

TLP798G

TELECOMMUNICATION

DATA ACQUISITION

MEASUREMENT INSTRUMENTATION

The TOSHIBA TLP798G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a six lead plastic DIP package (DIP6).

The TLP798G is a bi-directional switch which can replace mechanical relays in many applications.

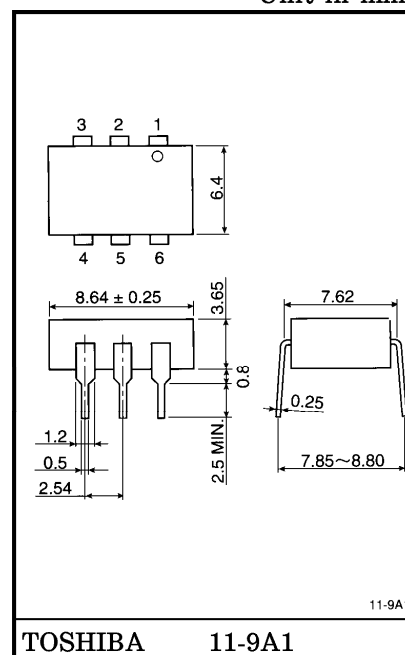
- Peak Off-State Voltage : 400 V (MIN.)
- On-State Current : 150 mA (MAX.) (A Connection)
- On-State Resistance : 12 Ω (MAX.) (A Connection)
- Isolation Voltage : 5000 Vrms (MIN.) (A Connection)
- Isolation Thickness : 0.4 mm (MIN.)
- Trigger LED Current (Ta = 25°C)

CLASSIFICATION (Note 1)	Trigger LED Current (mA)		MARKING OF CLASSIFICATION
	@ION = 150 mA		
	Min.	Max.	
(IFT2)	—	2	T2
Standard	—	5	T2, blank

(Note 1) : Application type name for certification test,
please use standard product type name, i.e.
TLP798G (IFT2) : TLP798G

- BSI Approved : BS EN60065 : 1994, Certificate No. 8318
BS EN60950 : 1992, Certificate No. 8319
- Option (D4) type
TUV Approved : DIN VDE0884 / 06.92,
Certificate No. 9850585

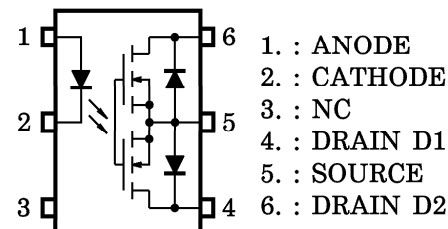
Unit in mm



TOSHIBA 11-9A1

Weight : 0.49 g

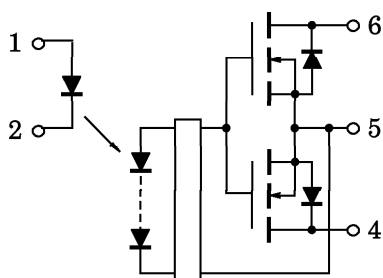
PIN CONFIGURATION (TOP VIEW)



980910EBC2

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

SCHEMATIC



MAXIMUM RATINGS (Ta = 25°C)

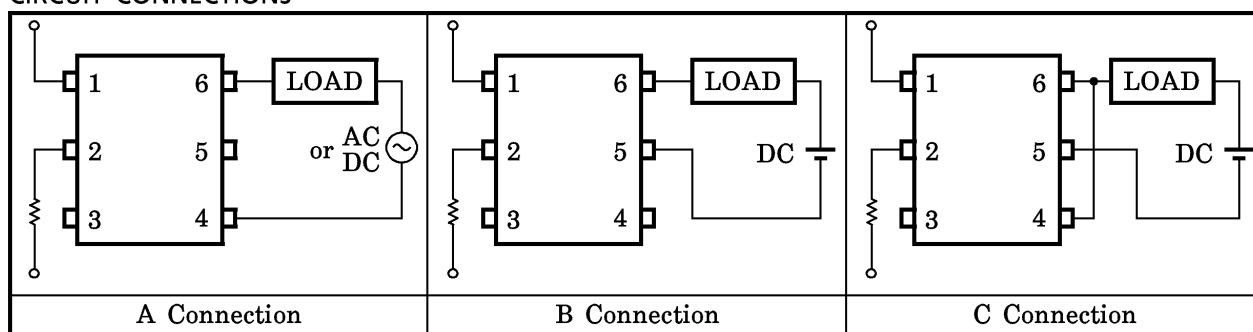
CHARACTERISTIC			SYMBOL	RATING	UNIT
LED	Forward Current		I _F	30	mA
	Forward Current Derating (Ta ≧ 25°C)		ΔI _F / °C	−0.3	mA / °C
	Peak Forward Current (100 μs pulse, 100 pps)		I _{FP}	1	A
	Reverse Voltage		V _R	5	V
	Junction Temperature		T _j	125	°C
DETECTOR	Off-State Output Terminal Voltage		V _{OFF}	400	V
	On-State RMS Current	A Connection	I _{ON}	150	mA
		B Connection		200	
		C Connection		300	
	On-State Current Derating (Ta ≧ 25°C)	A Connection	ΔI _{ON} / °C	−1.5	mA / °C
		B Connection		−2.0	
		C Connection		−3.0	
	Junction temperature		T _j	125	°C
Storage Temperature Range		T _{stg}	−55~125	°C	
Operating Temperature Range		T _{opr}	−40~85	°C	
Lead Soldering Temperature (10 s)		T _{sol}	260	°C	
Isolation Voltage (AC, 1min., R.H. ≦ 60%)(Note 2)		BV _S	5000	Vrms	

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

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{DD}	—	—	320	V
Forward Current	I_F	10	15	20	mA
On-State Current	I_{ON}	—	—	150	mA
Operating Temperature	T_{opr}	-20	—	80	°C

CIRCUIT CONNECTIONS

INDIVIDUAL ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V_F	$I_F = 10\text{ mA}$	1.2	1.4	1.7	V
	Reverse Current	I_R	$V_R = 3\text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1\text{ MHz}$	—	30	—	pF
DETECTOR	Off-State Current	I_{OFF}	$V_{OFF} = 400\text{ V}$	—	—	1	μA
	Capacitance	C_{OFF}	$V = 0, f = 1\text{ MHz}$	—	150	—	pF

COUPLED ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current		I_{FT}	$I_{ON} = 150\text{ mA}$	—	1	5	mA
On-State Resistance	A Connection	R_{ON}	$I_{ON} = 150\text{ mA}, I_F = 10\text{ mA}$	—	8	12	Ω
	B Connection		$I_{ON} = 200\text{ mA}, I_F = 10\text{ mA}$	—	4	6	
	C Connection		$I_{ON} = 300\text{ mA}, I_F = 10\text{ mA}$	—	2	3	

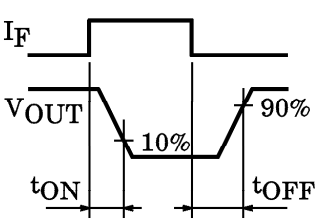
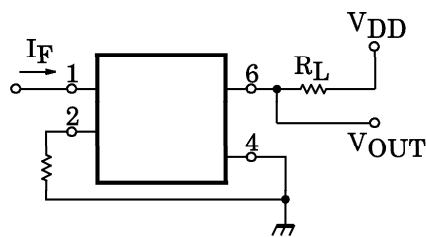
ISOLATION CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

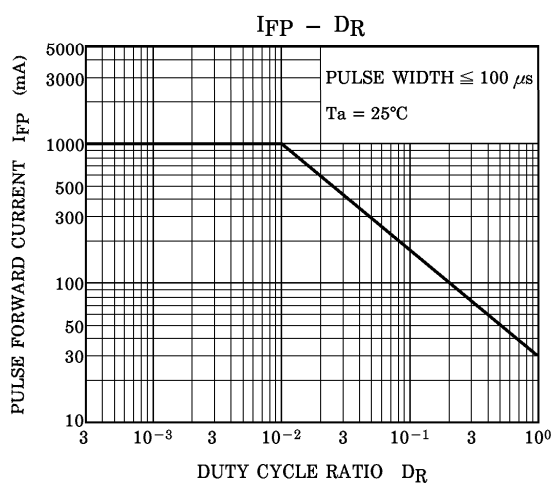
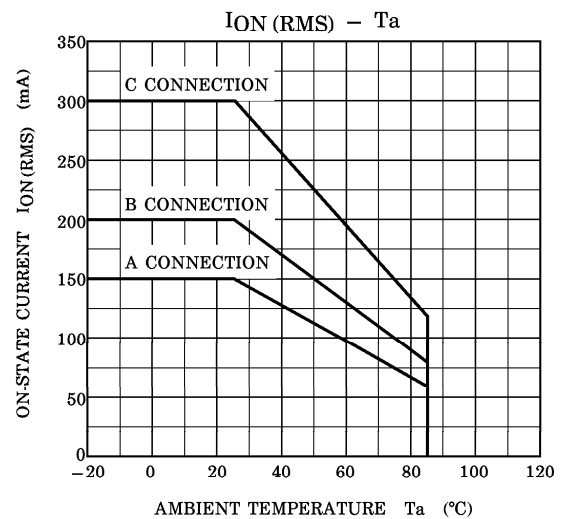
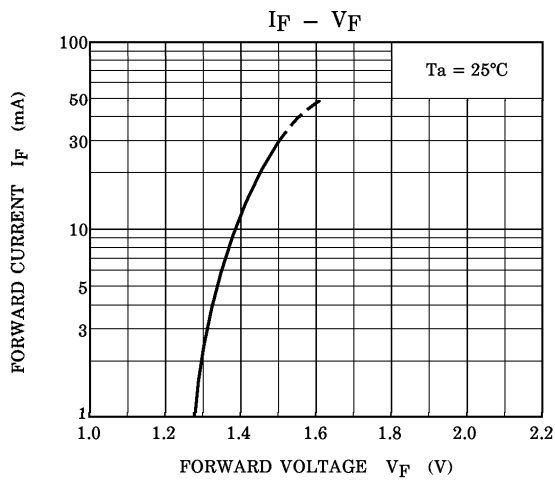
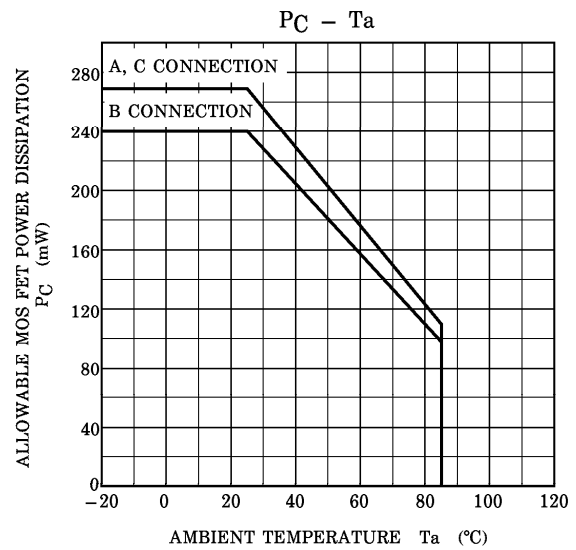
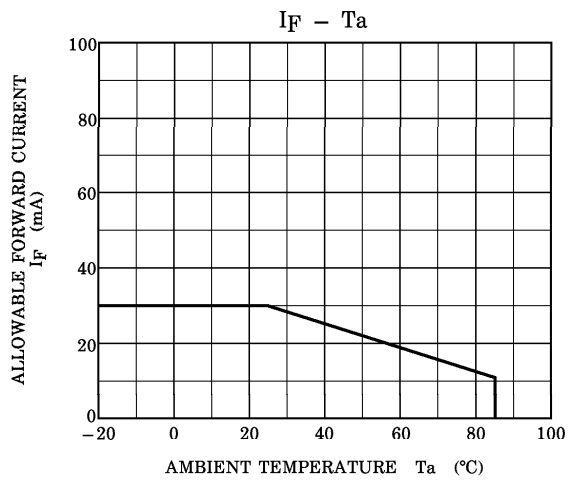
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	$V_S = 0, f = 1\text{ MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500\text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	5000	—	—	V_{rms}
		AC, 1 second (in Oil)	—	10000	—	
		DC, 1 minute (in Oil)	—	10000	—	V_{DC}

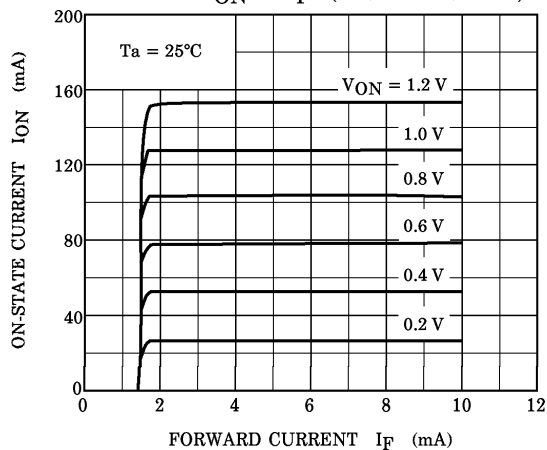
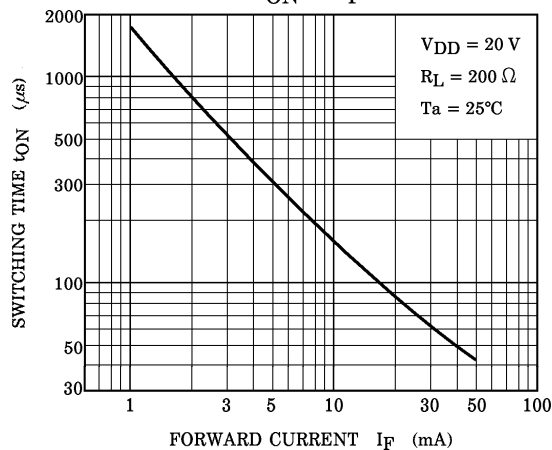
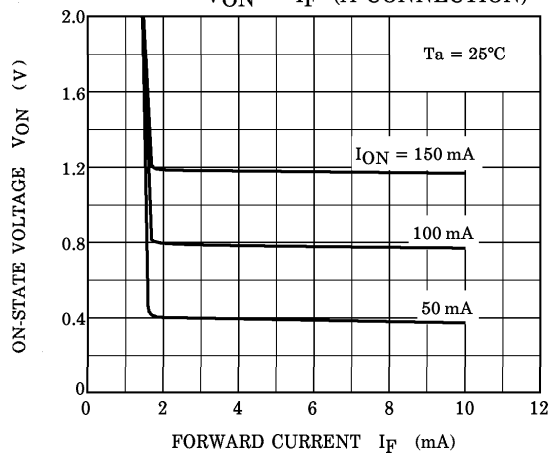
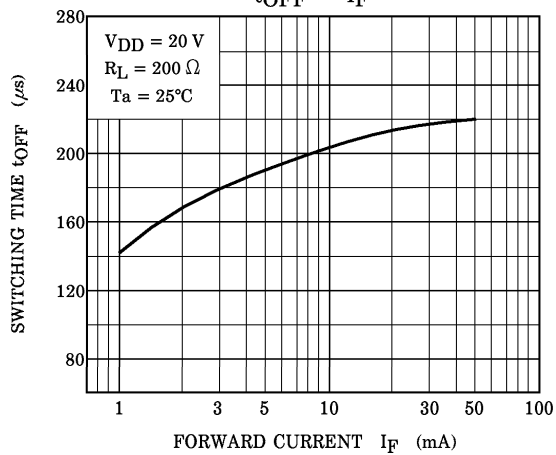
SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	t _{ON}	V _{DD} = 20 V, R _L = 200 Ω I _F = 10 mA (Note 3)	—	0.3	1.0	ms
Turn-off Time	t _{OFF}		—	0.2	1.0	

(Note 3) : SWITCHING TIME TEST CIRCUIT





$I_{ON} - I_F$ (A CONNECTION) $t_{ON} - I_F$  $V_{ON} - I_F$ (A CONNECTION) $t_{OFF} - I_F$  $I_{ON} - V_{ON}$ (A CONNECTION)