#### TOSHIBA PHOTOCOUPLER PHOTO RELAY

# **TLP598A**

TELECOMMUNICATION

DATA ACQUISITION

MEASUREMENT INSTRUMENTATION

The TOSHIBA TLP598A 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 TLP598A is a bi-directional switch which can replace mechanical relays in many applications.

• Peak Off-State Voltage : 60 V (MIN.)

• On-State Current : 300 mA (MAX.) (A Connection)

• On-State Resistance : 2 Ω (MAX.) (A Connection)

• Isolation Voltage : 2500 Vrms (MIN.)

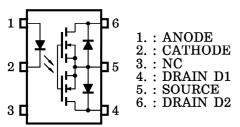
• UL Recognized : UL1577, File No. E67349

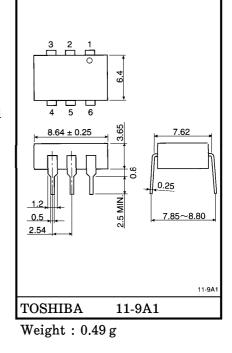
• Trigger LED Current (Ta = 25°C)

CLASSIFICATION (Note 1)	Trigger LE (m		MARKING OF		
	○T 200 A		CLASSIFICATION		
	Min.	Max.			
(IFT2)	_	2	T2		
Standard	_	5	T2, blank		

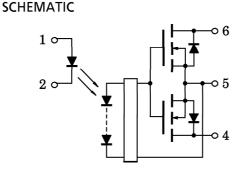
(Note 1): Application type name for certification test, please use standard product type name, i.e. TLP598A (IFT2): TLP598A

#### PIN CONFIGURATION (TOP VIEW)





Unit in mm



2001-06-01

## MAXIMUM RATINGS (Ta = 25°C)

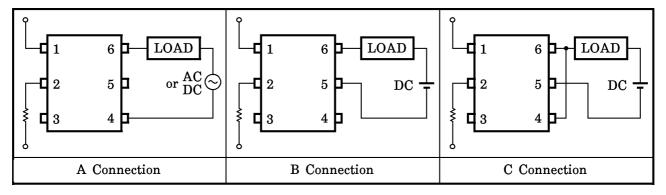
					_	
	CHARACTERI	SYMBOL	RATING	UNIT		
	Forward Current		${ m I_F}$	30	mA	
ا <sub>~</sub> ا	Forward Current Derating (	$Ta \ge 25$ °C)	ΔI <sub>F</sub> /°C	-0.3	mA/°C	
LED	Peak Forward Current (100	$I_{\mathrm{FP}}$	1	A		
	Reverse Voltage	$v_{ m R}$	5	V		
	Junction Temperature	$T_{j}$	125	°C		
	Off-State Output Terminal	$v_{OFF}$	60	V		
		A Connection		300		
$^{ m OR}$	On-State RMS Current	B Connection	$I_{ON}$	450	mA	
DETECTOR		C Connection		600		
Œ	On State Grand Daniel	A Connection		-3		
邑	On-State Current Derating (Ta $\geq$ 25°C)	B Connection	⊿I <sub>ON</sub> /°C	-4.5	mA/°C	
	$(1a \leq 25 \text{ C})$	C Connection		-6	1	
	Junction Temperature		$T_{j}$	125	°C	
Sto	rage Temperature Range	$\mathrm{T_{stg}}$	-55~125	°C		
Operating Temperature Range			$T_{ m opr}$	-40~85	°C	
Lead Soldering Temperature (10 s)			$T_{sol}$	260	°C	
Iso	lation Voltage (AC, 1 min., F	$R.H. \leq 60\%$ ) (Note 2)	$BV_{\mathbf{S}}$	2500	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	$v_{ m DD}$	_	_	48	V
Forward Current	$I_{\mathbf{F}}$	10	15	20	mA
On-State Current	$I_{ON}$	_	_	300	mA
Operating Temperature	$T_{ m opr}$	-20	_	80	$^{\circ}\mathrm{C}$

#### **CIRCUIT CONNECTIONS**



## INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
	Forward Voltage	$V_{\mathbf{F}}$	$I_{ m F}=10~{ m mA}$	1.2	1.4	1.7	V
ED	Reverse Current	$I_{\mathbf{R}}$	$V_{R} = 3 V$	_	_	10	$\mu$ A
$_{ m T}$	Capacitance	$\mathrm{C}_{\mathrm{T}}$	V = 0, $f = 1 MHz$		30		pF
ror	Off-State Current	$I_{ m OFF}$	$V_{OFF} = 60 V$	1		1	$\mu$ A
DETEC	Capacitance	$c_{\mathrm{OFF}}$	$V=0, f=1  \mathrm{MHz}$	_	_	_	pF

#### COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTE	RISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Curre	ent	$I_{\mathrm{FT}}$	$I_{ON} = 300  \text{mA}$	_	1	5	mA
On-State	A Connection	l	$I_{ m ON} = 300   m mA,$ $I_{ m F} = 10   m mA$	_	1.4	2	0
Resistance	B Connection	$R_{ON}$	$I_{ON} = 450 \text{ mA}, I_{F} = 10 \text{ mA}$	_	0.7	1	7.7
	C Connection		$I_{ON} = 600 \text{ mA}, I_{F} = 10 \text{ mA}$	_	0.35	0.5	

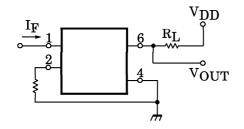
## ISOLATION CHARACTERISTICS (Ta = 25°C)

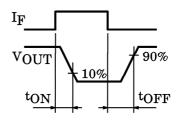
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	$C_{\mathbf{S}}$	$V_{S} \equiv 0, f = 1 MHz$	_	0.8	_	pF
Isolation Resistance	RS	$V_{S} = 500 \text{ V}, \text{ R.H.} \le 60\%$	$5  imes 10^{10}$	$10^{14}$		Ω
Isolation Voltage		AC, 1 minute	2500	_	_	37
	$BV_S$	AC, 1 second (in oil)	_	5000	_	Vrms
		DC, 1 minute (in oil)	_	5000	_	$v_{DC}$

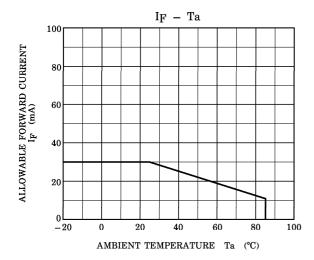
## SWITCHING CHARACTERISTICS (Ta = 25°C)

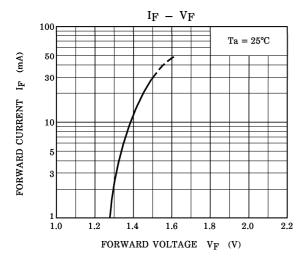
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	ton	$V_{ m DD} = 20 \  m V, \ R_{ m L} = 200 \  m \Omega$	_	0.2	0.5	ma
Turn-off Time	tOFF	$I_F = 10 \text{ mA}$ (Note 3)	-	0.2	0.5	ms

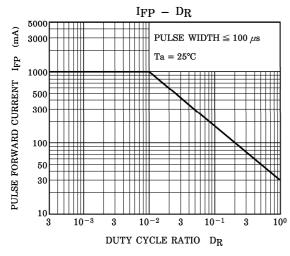
(Note 3): SWITCHING TIME TEST CIRCUIT

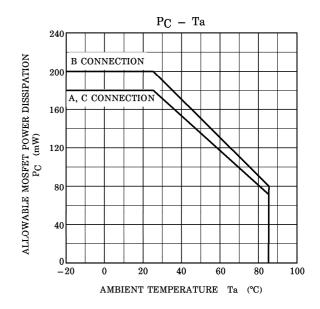


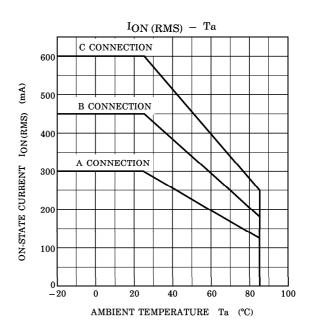


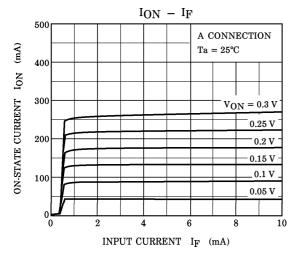


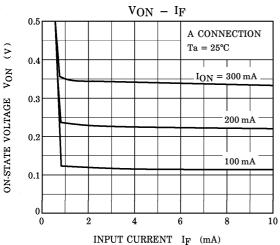


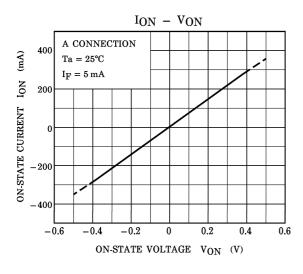


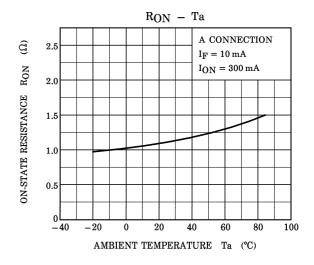


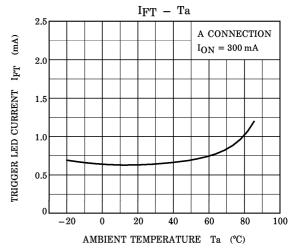


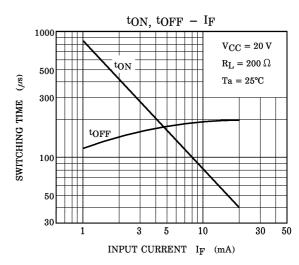












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