

TENTATIVE

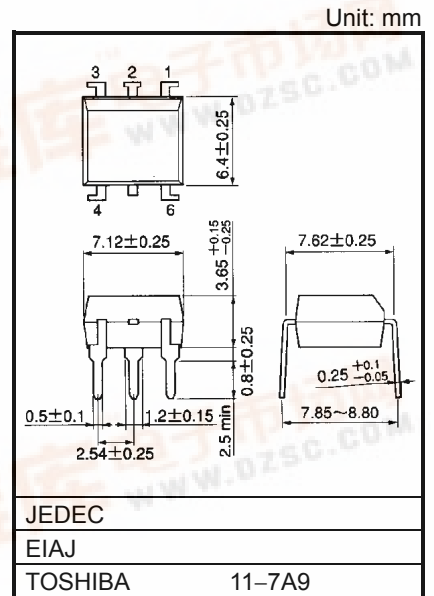
TOSHIBA PHOTOCOUPLER PHOTO RELAY

# TLP3542

TESTERS  
DATA RECORDING EQUIPMENT  
MEASURING EQUIPMENT

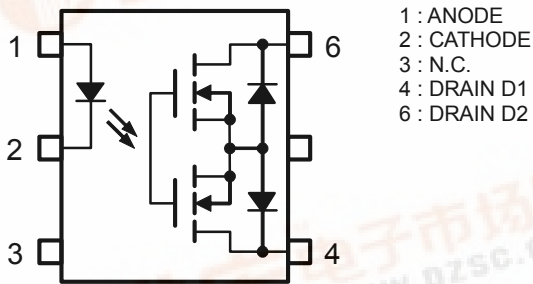
The TOSHIBA TLP3542 series consist of a aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a plastic DIP package.  
The TLP3542 series are a bi-directional switch, which can replace mechanical relays in many applications.

- 6 pin DIP (DIP6)
- 1-Form-A
- Peak Off-State Voltage : 60 V (MIN.)
- Trigger LED Current : 3 mA (MAX.)
- On-State Current : 2.5 A (MAX.)
- On-State Resistance : 100 mΩ (MAX.)
- Isolation Voltage : 2500 Vrms (MIN.)
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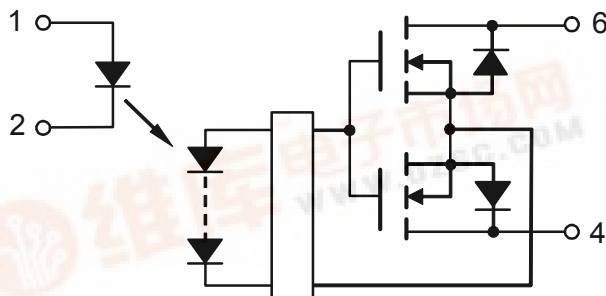


Weight: 0.4 g

## PIN CONFIGURATION (TOL VIEW)



## SCHEMATIC



## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I <sub>F</sub>	30	mA
	Forward Current Derating (Ta ≥ 25°C)	ΔI <sub>F</sub> /°C	-0.3	mA/°C
	Peak Forward Current (100 μs pulse, 100 pps)	I <sub>FP</sub>	1	A
	Reverse Voltage	V <sub>R</sub>	5	V
	Junction Temperature	T <sub>j</sub>	125	°C
DETECTOR	Off-State Output Terminal Voltage	V <sub>OFF</sub>	60	V
	On-State Current	I <sub>ON</sub>	2.5	A
	On-State Current Derating (Ta ≥ 40°C)	ΔI <sub>ON</sub> /°C	22	mA/°C
	Junction Temperature	T <sub>j</sub>	125	°C
Storage Temperature Range		T <sub>stg</sub>	-40~125	°C
Operating Temperature Range		T <sub>opr</sub>	-20~85	°C
Lead Soldering Temperature (10 s)		T <sub>sol</sub>	260	°C
Isolation Voltage (AC, 1 minute, R.H. ≤ 60%) (NOTE1)		BV <sub>S</sub>	2500	Vrms

(NOTE1) :Device considered a two-terminal device : Pins 1, 2 and 3 shorted together, and pins 4 and 6 shorted together.

## RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sub>DD</sub>	—	—	48	V
Forward Current	I <sub>F</sub>	10	—	20	mA
On-State Current	I <sub>ON</sub>	—	—	2.5	A
Operating Temperature	T <sub>opr</sub>	25	—	60	°C

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

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	$V_F$	$I_F = 10 \text{ mA}$	1.18	1.33	1.48	V
	Reverse Current	$I_R$	$V_R = 5 \text{ V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
DETECTOR	Off-State Current	$I_{OFF}$	$V_{OFF} = 20 \text{ V}, T_a = 25^\circ\text{C}$	—	0.1	1.5	nA
			$V_{OFF} = 60 \text{ V}, T_a = 25^\circ\text{C}$	—	1.0	10	nA
	Capacitance	$C_{OFF}$	$V = 0, f = 1 \text{ MHz}$	—	400	600	pF

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	$I_{FT}$	$I_{ON} = 1.0 \text{ A}$	—	1	3	mA
Return LED Current	$I_{FC}$	$I_{OFF} = 10 \mu\text{A}$	0.1	—	—	mA
On-State Resistance	$R_{ON}$	$I_{ON} = 2.0 \text{ A}, I_F = 10 \text{ mA}, t = 10 \text{ ms}$	—	65	100	m $\Omega$

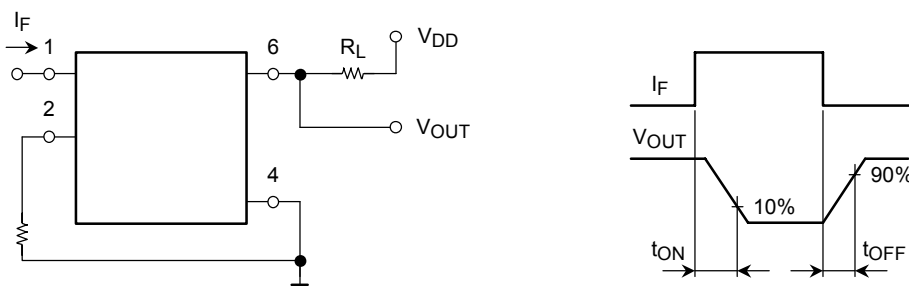
## ISOLATION CHARACTERISTICS (Ta = 25°C)

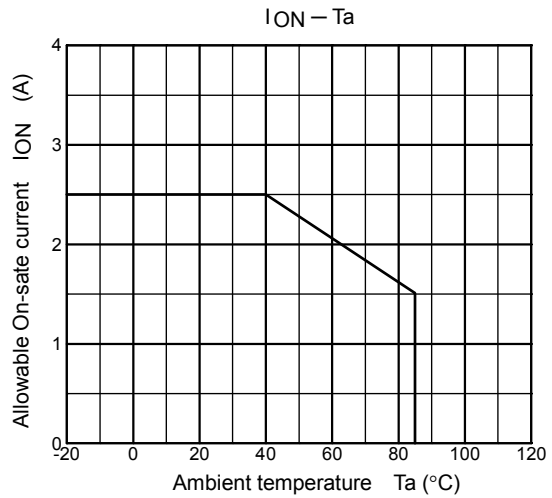
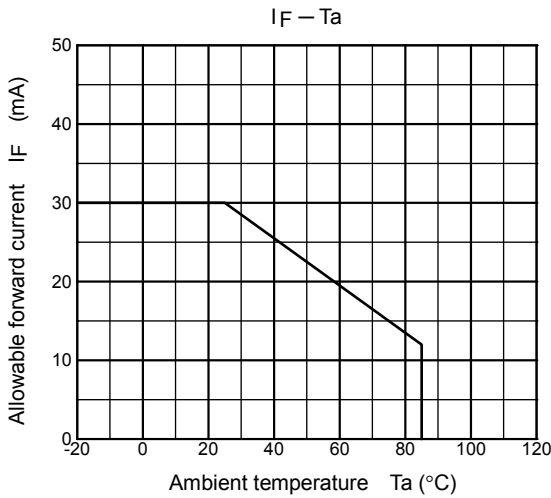
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	$C_S$	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation Voltage	$BV_S$	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second (in oil)	—	5000	—	—
		DC, 1 minute (in oil)	—	5000	—	—

## SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	$t_{ON}$	$R_L = 200 \Omega$ (NOTE 2) $V_{DD} = 20 \text{ V}, I_F = 10 \text{ mA}$	—	1.0	1.5	ms
Turn-off Time	$t_{OFF}$		—	0.2	0.4	

(NOTE 2) : SWITCHING TIME TEST CIRCUIT





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