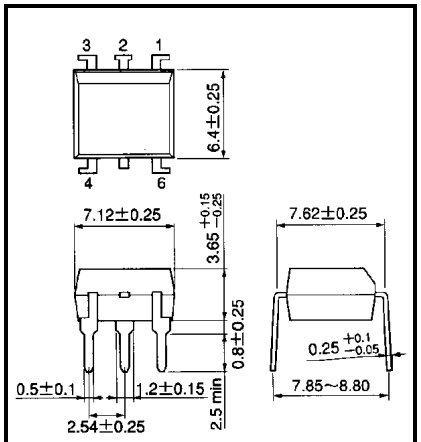
TOSHIBA PHOTOCOUPLER PHOTO RELAY

T L P 3 5 4 2

TESTERS
DATA RECORDING EQUIPMENTS
MEASUREMENT EQUIPMENTS

Unit: mm



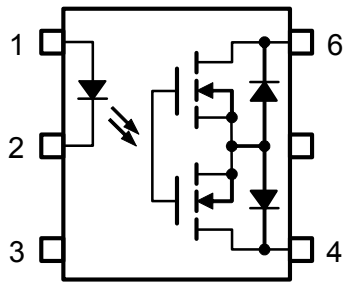
JEDEC	
EIAJ	
TOSHIBA	11−7A9

Weight: 0.4 g

The TOSHIBA TLP3542 consist of a aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a plastic DIP package.
The TLP3452 series are a bi-directional switch, which can replace mechanical relays in many applications. And its its high on-state current maximum rating is suitable to control a power line.

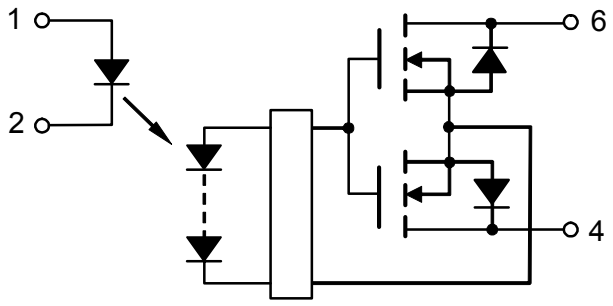
- 6 pin DIP (DIP6)
- 1-Form-A
- Peak Off-State Voltage : 60 V (MIN.)
- Trigger LED Current : 3 mA (MAX.)
- On-State Current : 2.5 A (MAX.)
- On-State Resistance : 100 mΩ (MAX.)
- Output capacitance : 600 pF (MAX.)
- Isolation Voltage : 2500 Vrms (MIN.)
-

PIN CONFIGURATION (TOL VIEW)



1 : ANODE
2 : CATHODE
3 : N.C.
4 : DRAIN D1
6 : DRAIN D2

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
	Reverse Voltage	V_R	5	V
	Junction Temperature	T_j	125	°C
DETECTOR	Off-State Output Terminal Voltage	V_{OFF}	60	V
	On-State Current	I_{ON}	2.5	A
	On-State Current Derating(Ta ≧ 40°C)	ΔI_{ON}/°C	-22	mA/°C
	Junction Temperature	T_j	125	°C
Storage Temperature Range		T_{stg}	−40~125	°C
Operating Temperature Range		T_{opr}	−20~85	°C
Lead Soldering Temperature (10 s)		T_{sol}	260	°C
Isolation Voltage (AC, 1 minute, R.H. ≦ 60%) (NOTE1)		BV_S	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_{DD}	—	—	48	V
Forward Current	I_F	10	—	20	mA
On-State Current	I_{ON}	—	—	2.5	A
Operating Temperature	T_{opr}	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 mA	1.18	1.33	1.48	V
	Reverse Current	I_R	V_R = 5 V	—	—	10	μA
	Capacitance	C_T	V = 0, f = 1 MHz	—	70	—	pF
DETECTOR	Off-State Current	I_{OFF}	V_{OFF} = 20 V	—	0.1	1.5	nA
			V_{OFF} = 60 V	—	1.0	10	nA
	Capacitance	C_{OFF}	V = 0, f = 1 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 A	—	1	3	mA
Return LED Current	I_{FC}	I_{OFF} = 10 μA	0.1	—	—	mA
On-State Resistance	R_{ON}	I_{ON} = 2.0 A, I_F = 10 mA, t = 10 ms	—	65	100	mΩ

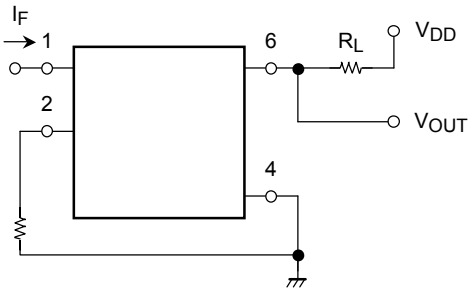
ISOLATION CHARACTERISTICS (Ta = 25°C)

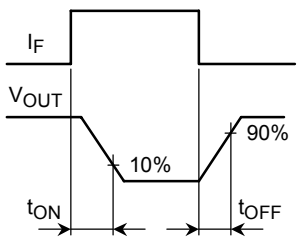
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	V_S = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation Resistance	R_S	V_S = 500 V, R.H. ≦ 60%	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second (in oil)	—	5000	—	
		DC, 1 minute (in oil)	—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

SWITCHING CHARACTERISTICS (Ta = 25°C)

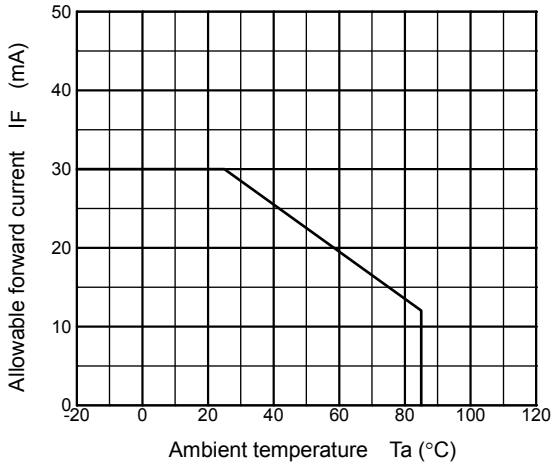
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	t_{ON}	R_L = 200 Ω (NOTE 2) V_{DD} = 20 V, I_F = 5 mA	—	1.5	3.0	ms
Turn-off Time	t_{OFF}		—	0.2	0.6	
Turn-on Time	t_{ON}	R_L = 200 Ω (NOTE 2) V_{DD} = 20 V, I_F = 10 mA	—	1.0	1.5	ms
Turn-off Time	t_{OFF}		—	0.2	0.4	

(NOTE 2) : SWITCHING TIME TEST CIRCUIT

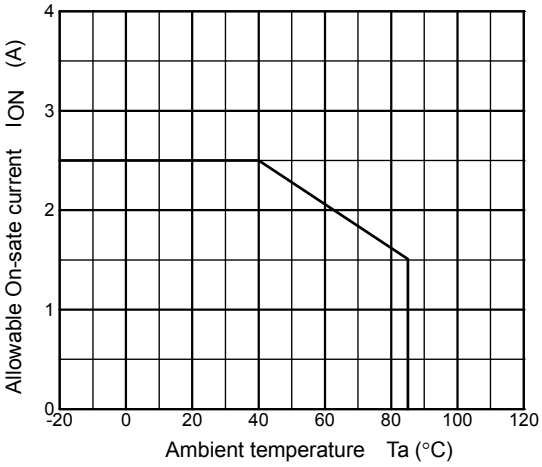




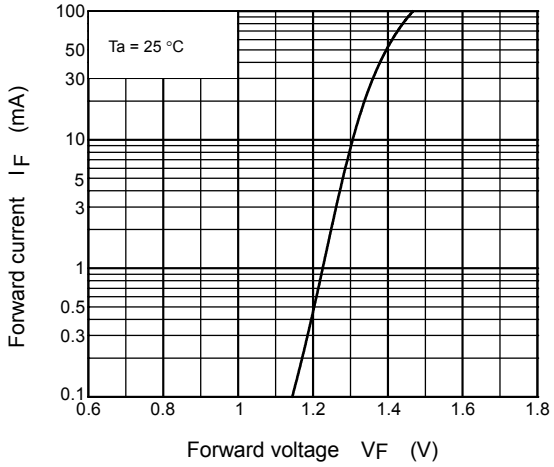
$I_F - Ta$



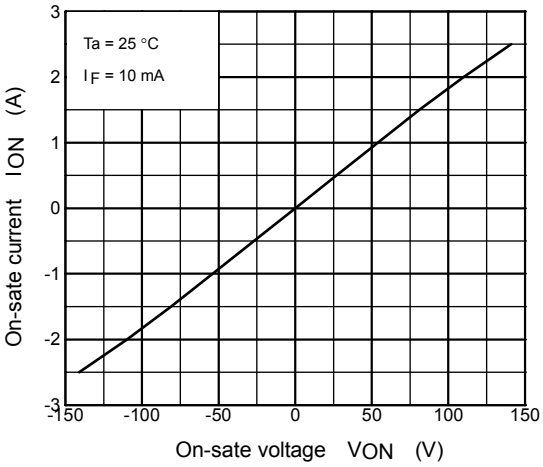
$I_{ON} - Ta$



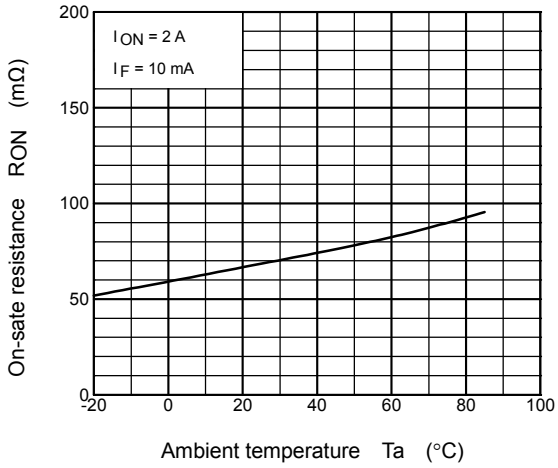
$I_F - V_F$



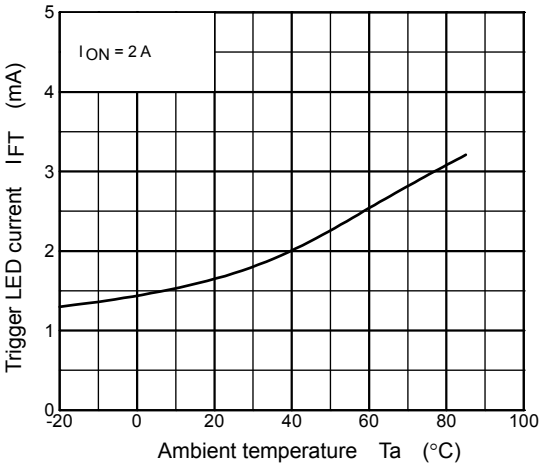
$I_{ON} - V_{ON}$



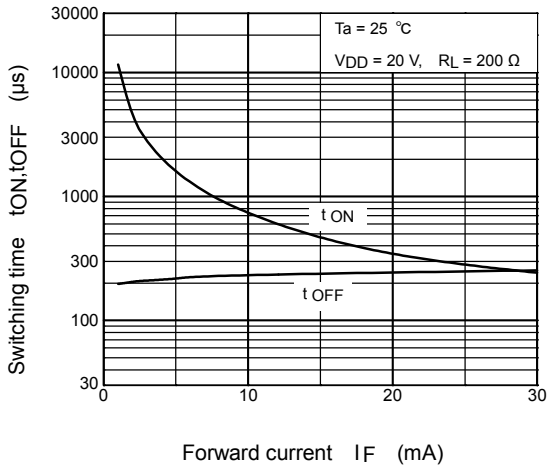
$R_{ON} - Ta$



$I_{FT} - Ta$

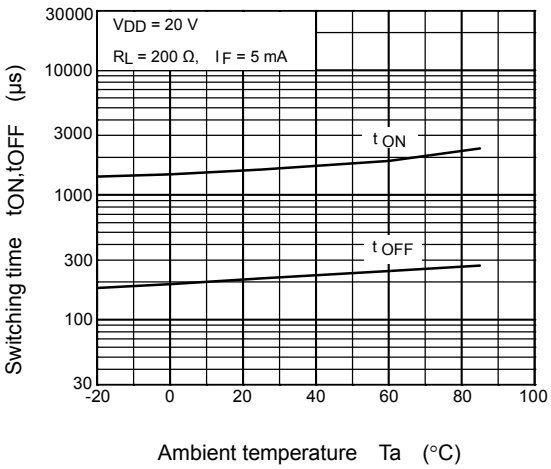


tON,tOFF ─ IF



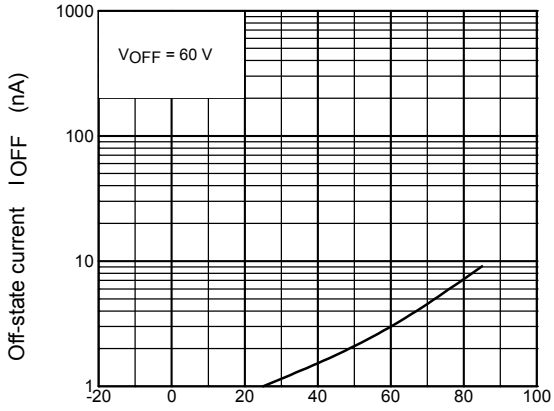
Forward current IF (mA)

tON,tOFF ─ Ta



Ambient temperature Ta (°C)

IOFF ─ Ta



Ambient temperature Ta (°C)

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