

(TLP628)

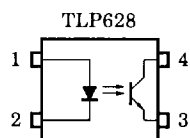
PROGRAMMABLE CONTROLLERS.
DC - OUTPUT MODULE.
TELECOMMUNICATION.

The TOSHIBA TLP628, -2, and -4 consists of a gallium arsenide infrared emitting diode optically coupled to a phototransistor which has a 350V high voltage of collector-emitter breakdown voltage.

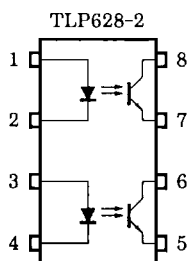
The TLP628-2 offers two isolated channels in a eight lead plastic DIP package, while the TLP628-4 provide four isolated channels per package.

- Collector-Emitter Voltage : 350V (Min.)
- Current Transfer Ratio : 50% (Min.)
- Isolation Voltage : 5000Vrms (Min.)
- UL Recognized : UL1577, File No. E67349

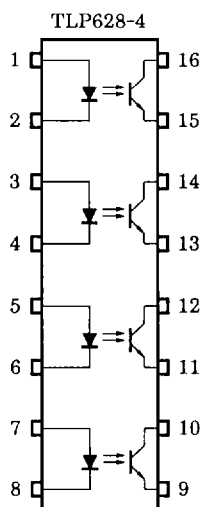
PIN CONFIGURATIONS (TOP VIEW)



1 : ANODE
2 : CATHODE
3 : EMITTER
4 : COLLECTOR



1, 3 : ANODE
2, 4 : CATHODE
5, 7 : EMITTER
6, 8 : COLLECTOR



1, 3, 5, 7 : ANODE
2, 4, 6, 8 : CATHODE
9, 11, 13, 15 : EMITTER
10, 12, 14, 16 : COLLECTOR

Unit in mm

		TLP628 Weight : 0.26g
JEDEC	—	
EIAJ	—	
TOSHIBA	11-5B1	
		TLP628-2 Weight : 0.54g
JEDEC	—	
EIAJ	—	
TOSHIBA	11-10C1	
		TLP628-4 Weight : 1.1g
JEDEC	—	
EIAJ	—	
TOSHIBA	11-20A1	

TLP628, -2, -4

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MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING		UNIT
			TLP628	TLP628-2 TLP628-4	
LED	Forward Current	I _F	60	50	mA
	Forward Current Derating	ΔI _F / °C	-0.7 (Ta ≥ 39°C)	-0.5 (Ta ≥ 25°C)	mA / °C
	Pulse Forward Current	I _{FP}	1 (100μs pulse, 100pps)		A
	Reverse Voltage	V _R	5		V
	Junction Temperature	T _j	125		°C
DETECTOR	Collector-Emitter Voltage	V _{CEO}	350		V
	Emitter-Collector Voltage	V _{ECO}	7		V
	Collector Current	I _C	50		mA
	Collector Power Dissipation (1 Circuit)	P _C	150	100	mW
	Collector Power Dissipation Derating (Ta ≥ 25°C, 1 Circuit)	ΔP _C / °C	-1.5	-1.0	mW / °C
	Junction Temperature	T _j	125		°C
Storage Temperature Range		T _{stg}	-55~150		°C
Operating Temperature Range		T _{opr}	-55~100		°C
Lead Soldering Temperature		T _{sol}	260 (10s)		°C
Total Package Power Dissipation (1 Circuit)		P _T	200	150	mW
Total Package Power Dissipation Derating (Ta ≥ 25°C, 1 Circuit)		ΔP _T / °C	-2.0	-1.5	mW / °C
Isolation Voltage		BVS	5000 (AC, 1min., R.H. ≤ 60%) (Note 1)		V _{rms}

Note 1 : Device considered a two terminal device : LED side pins shorted together and DETECTOR side pins shorted together.

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

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V_F	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse Current	I_R	$V_R = 5\text{V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1\text{MHz}$	—	30	—	pF
DETECTOR	Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 0.1\text{mA}$	350	—	—	V
	Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 0.1\text{mA}$	7	—	—	V
	Collector Dark Current	I_{CEO}	$V_{CE} = 300\text{V}$	—	10	200	nA
			$V_{CE} = 300\text{V}, T_a = 85^\circ\text{C}$	—	—	50	μA
	Capacitance Collector to Emitter	C_{CE}	$V = 0, f = 1\text{MHz}$	—	10	—	pF

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I_C / I_F	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$ Rank GB	50	—	600	%
			100	—	600	
Saturated CTR	$I_C / I_{F(\text{sat})}$	$I_F = 1\text{mA}, V_{CE} = 0.4\text{V}$ Rank GB	—	60	—	%
			30	—	—	
Collector-Emitter Saturation Voltage	$V_{CE(\text{sat})}$	$I_C = 2.4\text{mA}, I_F = 8\text{mA}$	—	—	0.4	V
		$I_C = 0.2\text{mA}, I_F = 1\text{mA}$	—	0.2	—	
		Rank GB	—	—	0.4	

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	$V_S = 500\text{V R.H.} \leq 60\%$	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	—	Vdc

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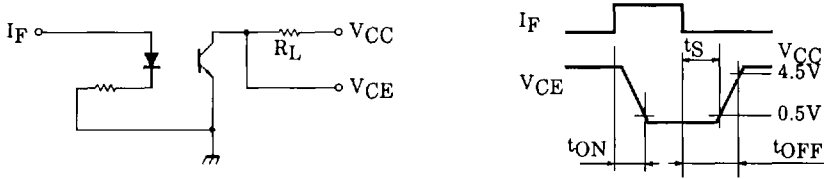
SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	t_r	$V_{CC} = 10V, I_C = 2mA$ $AR_L = 100\Omega$	—	2	—	μs
Fall Time	t_f		—	3	—	
Turn-on Time	t_{on}		—	3	—	
Turn-off Time	t_{off}		—	3	—	
Turn-on Time	t_{ON}	$R_L = 1.9k\Omega$ (Fig.1) $V_{CC} = 5V, I_F = 16mA$	—	3	—	μs
Storage Time	t_s		—	40	—	
Turn-off Time	t_{OFF}		—	90	—	

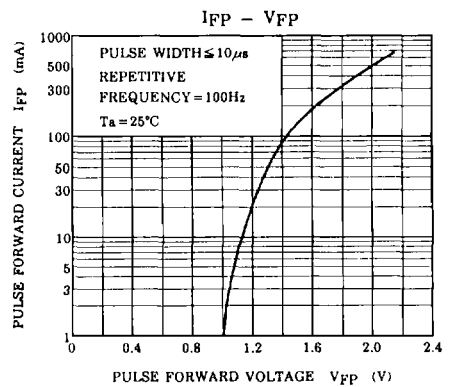
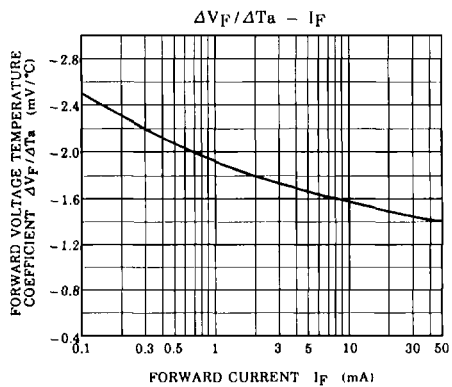
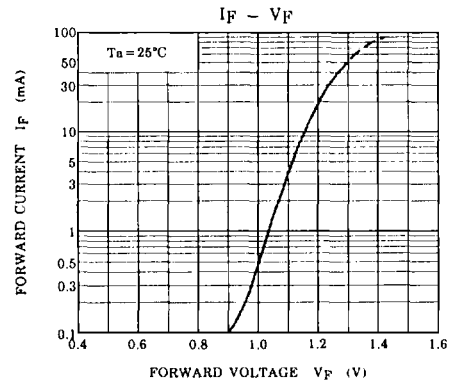
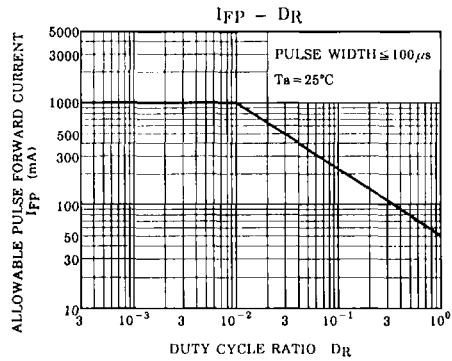
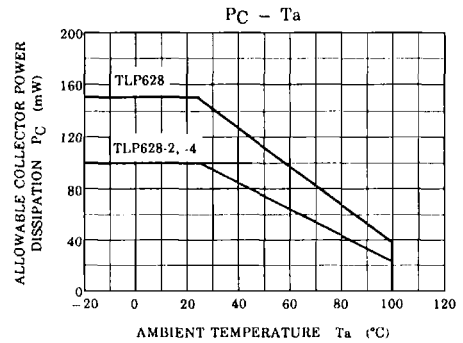
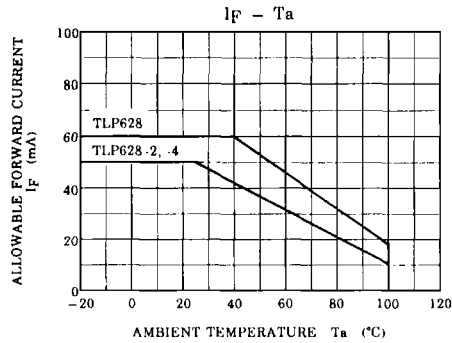
RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	—	—	200	V
Forward Current	I_F	—	16	25	mA
Collector Current	I_C	—	—	10	mA
Operating Temperature	T_{opr}	-25	—	85	°C

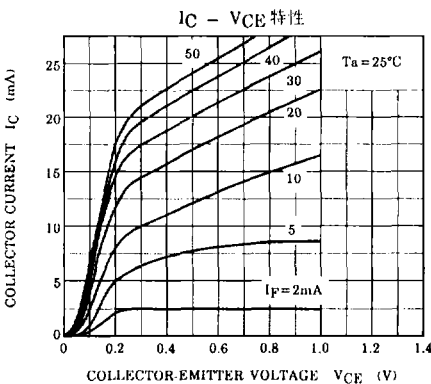
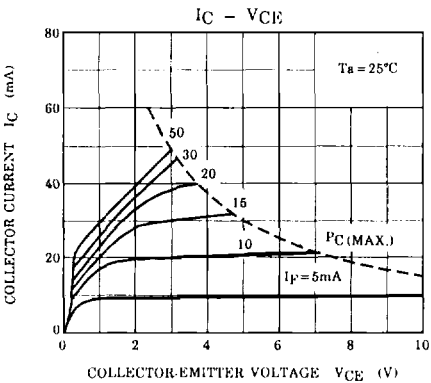
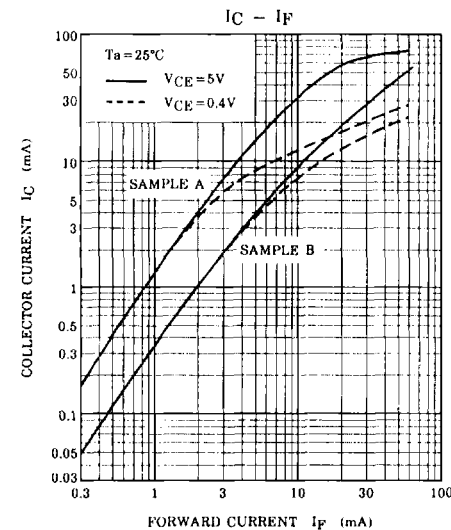
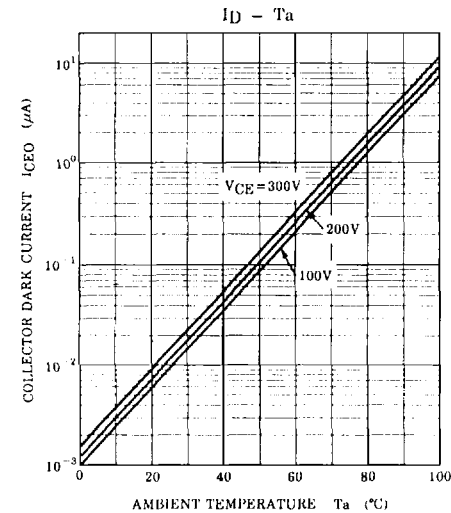
Fig.1 SWITCHING TIME TEST CIRCUIT



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(TLP628)



(TLP628)

