

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

TLP629, TLP629-2, TLP629-4

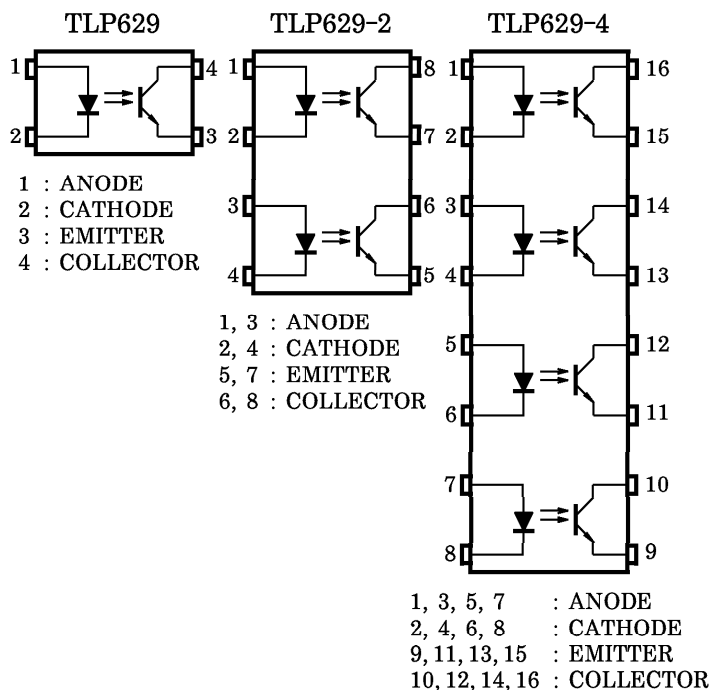
TELECOMMUNICATION
OFFICE MACHINE
TELEPHONE USE EQUIPMENT

The TOSHIBA TLP629, -2, and -4 consists of a photo-transistor optically coupled to a gallium arsenide infrared emitting diode.

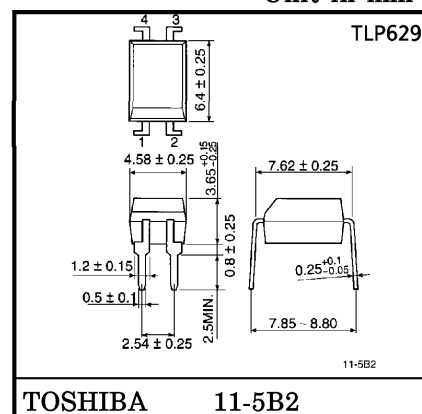
The TLP629-2 offers two isolated channels in an eight lead plastic DIP, while the TLP629-4 provides four isolated channels in a sixteen plastic DIP. This is suitable for application of DC input current up to 150mA.

- I_F Maximum Rating : 150mA
- Collector-Emitter Voltage : 55V (Min.)
- Current Transfer Ratio : 25% (Min.) ($I_F=20mA$)
- Isolation Voltage : 5000V_{rms} (Min.)
- UL Recognized : UL1577, File No. E67349

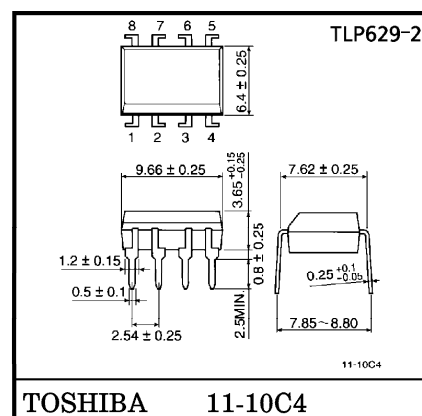
PIN CONFIGURATIONS (TOP VIEW)



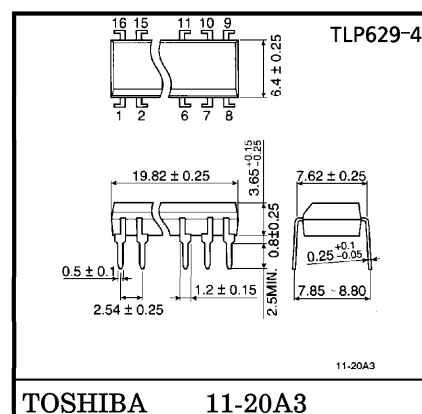
Unit in mm



Weight : 0.26g



Weight : 0.54g



Weight : 1.1g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING		UNIT
			TLP629	TLP629-2, 4	
LED	Forward Current	I _F	150		mA
	Forward Current Derating	ΔI _F / °C	−1.5 (Ta ≥ 25°C)		mA / °C
	Pulse Forward Current	I _{FP}	1 (100 μs pulse, 100pps)		A
	Reverse Voltage	V _R	5		V
	Junction Temperature	T _j	125		°C
DETECTOR	Collector-Emitter Voltage	V _{CEO}	55		V
	Emitter-Collector Voltage	V _{ECO}	7		V
	Collector Current	I _C	80		mA
	Collector Power Dissipation (1 Circuit)	P _C	150	100	mW
	Collector Power Dissipation Derating (1 Circuit, Ta ≥ 25°C)	ΔP _C / °C	−1.5	−1.0	mW / °C
	Junction Temperature	T _j	125		°C
Storage Temperature Range		T _{stg}	−55~125		°C
Operating Temperature Range		T _{opr}	−55~100		°C
Lead Soldering Temperature		T _{sol}	260 (10s)		°C
Total Package Power Dissipation		P _T	250	200	mW
Total Package Power Dissipation Derating (Ta ≥ 25°C)		ΔP _T / °C	−2.5	2.0	mW / °C
Isolation Voltage (Note 1)		BV _S	5000 (AC, 1min., RH ≤ 60%)		V _{rms}

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

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{CC}	—	5	24	V
Forward Current	I _F	—	20	120	mA
Collector Current	I _C	—	1	10	mA
Operating Temperature	T _{opr}	−25	—	85	°C

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V_F	$I_F = 100\text{mA}$	—	1.4	1.7	V
	Forward Current	I_F	$V_F = 0.7\text{V}$	—	2.5	20	μA
	Reverse Current	I_R	$V_R = 5\text{V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1\text{MHz}$	—	50	—	pF
DETECTOR	Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 0.5\text{mA}$	55	—	—	V
	Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 0.1\text{mA}$	7	—	—	V
	Collector Dark Current	I_{CEO}	$V_{CE} = 24\text{V}$	—	10	100	nA
			$V_{CE} = 24\text{V}, T_a = 85^\circ\text{C}$	—	2	50	μA
	Capacitance Collector to Emitter	C_{CE}	$V = 0, f = 1\text{MHz}$	—	10	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I_C / I_F	$I_F = 20\text{mA}, V_{CE} = 1\text{V}$	25	—	—	%
	I_C / I_F (High)	$I_F = 100\text{mA}, V_{CE} = 1\text{V}$	20	—	80	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 2.4\text{mA}, I_F = 20\text{mA}$	—	—	0.4	V
		$I_C = 2.4\text{mA}, I_F = 100\text{mA}$	—	—	0.4	
Off-State Collector Current	$I_C(\text{off})$	$V_F = 0.7\text{V}, V_{CEO} = 24\text{V}$	—	1	1.0	μA

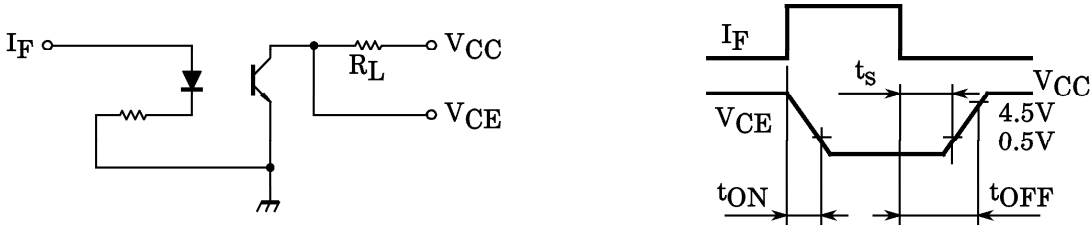
ISOLATION CHARACTERISTICS (Ta = 25°C)

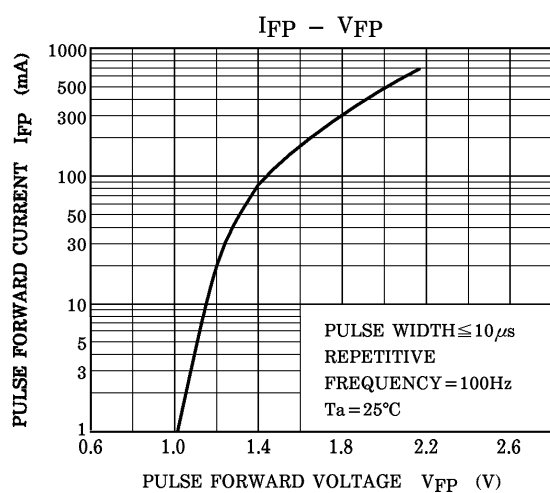
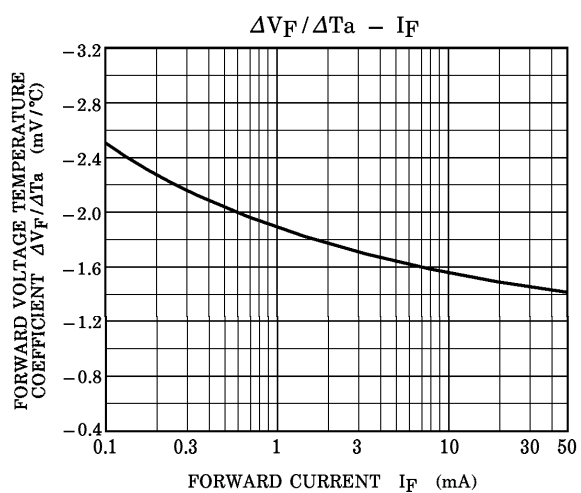
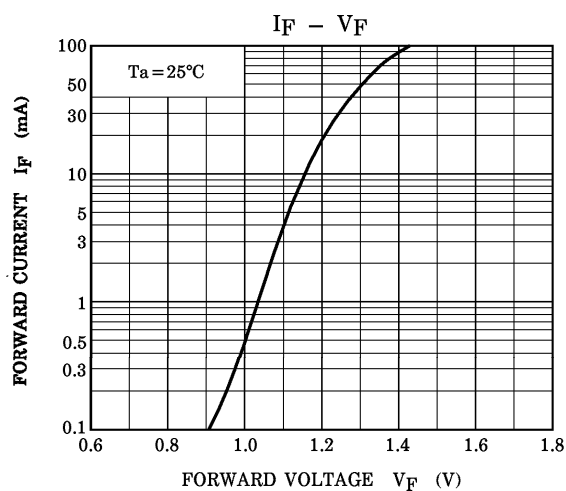
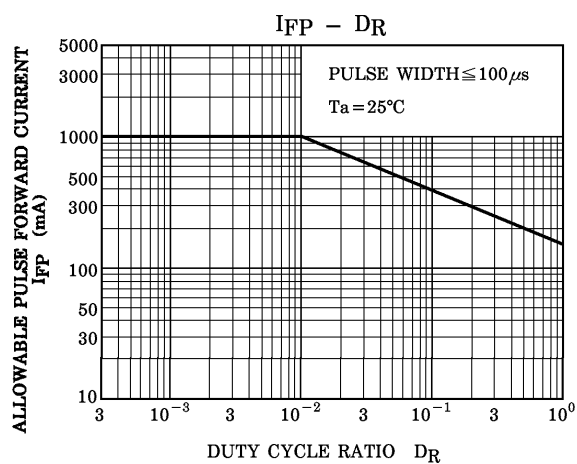
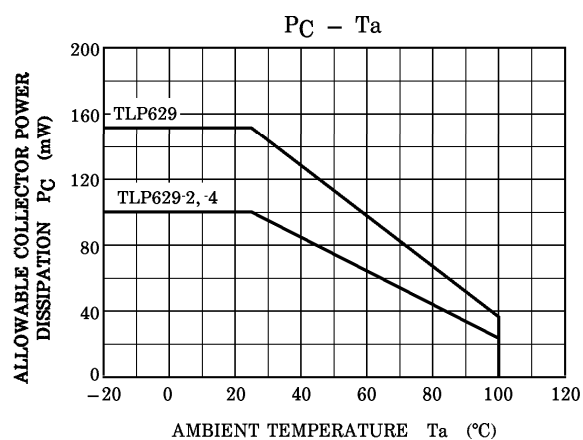
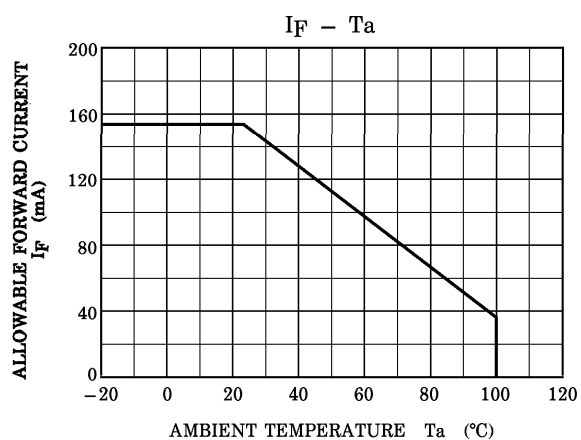
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500\text{V}$	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	5000	—	—	V_{rms}
		AC, 1 second, in oil	—	10000	—	
		DC, 1 minute, in oil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

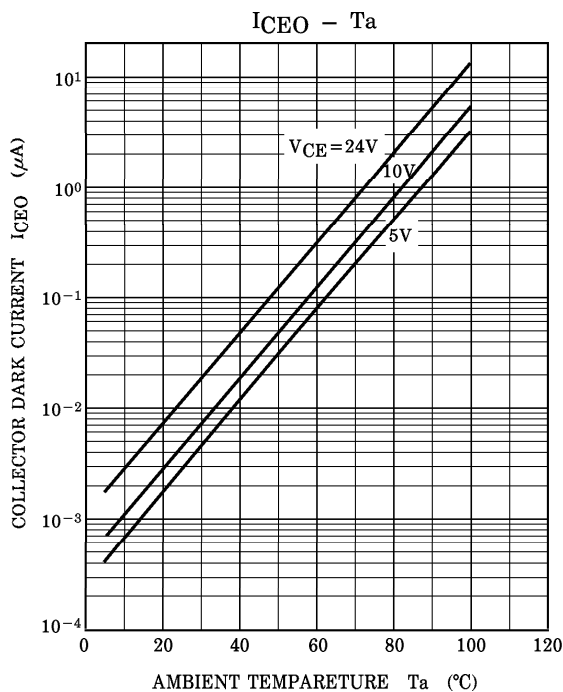
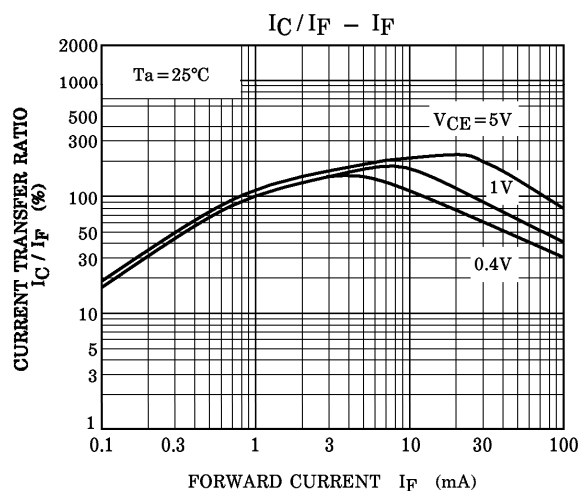
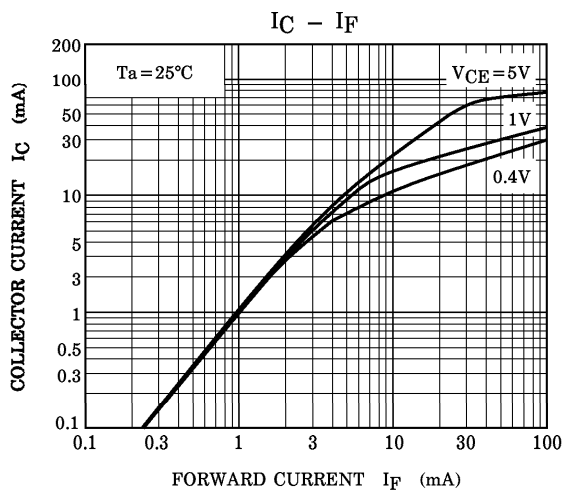
SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	t_r	$V_{CC}=10V, I_C=2mA$ $R_L=100\Omega$	—	2	—	μs
Fall Time	t_f		—	3	—	
Turn-on Time	t_{on}		—	3	10	
Turn-off Time	t_{off}		—	3	10	
Turn-on Time	t_{ON}	$R_L=1.9k\Omega$ (Fig.1) $V_{CC}=5V, I_F=16mA$	—	2	—	μs
Storage Time	t_s		—	15	—	
Turn-off Time	t_{OFF}		—	25	—	

Fig.1 SWITCHING TIME TEST CIRCUIT







RESTRICTIONS ON PRODUCT USE

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