

TLP624, -2, -4

GaAs IRED & PHOTO-TRANSISTOR

(TLP624)

PROGRAMMABLE CONTROLLERS
AC/DC-INPUT MODULE
TELECOMMUNICATION

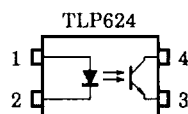
The TOSHIBA TLP624, -2 and -4 consist of a gallium arsenide infrared emitting diode optically coupled to a photo-transistor. The TLP624-2 offers two isolated channels in an eight lead plastic DIP package, while the TLP624-4 provides four isolated channels in a sixteen plastic DIP package.

- Collector-Emitter Voltage : 55V Min.
- Current Transfer Ratio

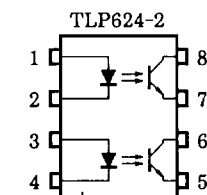
CLASSI- FICATION	CURRENT TRANSFER RATIO (Min.)			MARKING OF CLASSI- FICATION
	Ta = 25°C		Ta = -25~75°C	
	I _F = 1mA V _{CE} = 0.5V	I _F = 0.5mA V _{CE} = 1.5V	I _F = 1mA V _{CE} = 0.5V	
Rank BV	200%	100%	100%	BV
Standard	100%	50%	50%	BV, Blank

- Isolation Voltage : 5000V_{rms} Min.
- UL Recognized : UL1577 File No. E67349
- Note : Application type name for certification test, please use standard product type name, i.e.
TLP624 (BV) : TLP624
TLP624-2 (BV) : TLP624-2

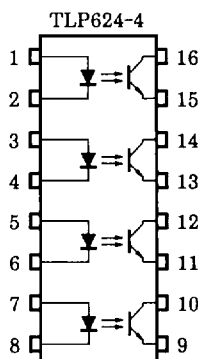
PIN CONFIGURATIONS (TOP VIEW)



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

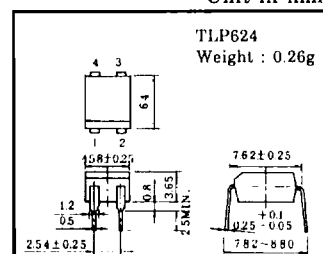


- 1, 3 : ANODE
2, 4 : CATHODE
5, 7 : EMITTER
6, 8 : COLLECTOR



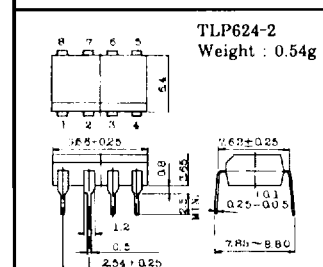
- 1, 3, 5, 7 : ANODE
2, 4, 6, 8 : CATHODE
9, 11, 13, 15 : EMITTER
10, 12, 14, 16 : COLLECTOR

Unit in mm



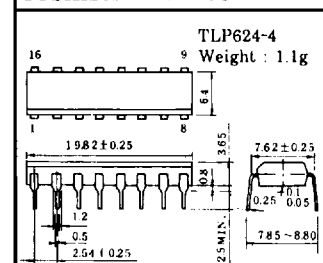
TLP624
Weight : 0.26g

JEDEC	—
EIAJ	—
TOSHIBA	11-5B1



TLP624-2
Weight : 0.54g

JEDEC	—
EIAJ	—
TOSHIBA	11-10C1



TLP624-4
Weight : 1.1g

JEDEC	—
EIAJ	—
TOSHIBA	11-20A1

(TLP624)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING		UNIT
			TLP624	TLP624-2 TLP624-4	
LED	Forward Current	I _F	60	50	mA
	Forward Current Detating	$\Delta I_F / ^\circ\text{C}$	-0.7 (Ta ≥ 39°C)	-0.5 (Ta ≥ 25°C)	mA / °C
	Pulse Forward Current	I _{FP}	1 (100μs pulse, 100pps)		A
	Power Dissipation (1 Circuit)	P _D	100	70	mW
	Power Dissipation Derating (Ta ≥ 25°C, 1 Circuit)	$\Delta P_D / ^\circ\text{C}$	-1.0	-0.7	mW / °C
	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	50		mA
	Collector Power Dissipation (1 Circuit)	P _C	150	100	mW
	Collector Power Dissipation Derating (Ta ≥ 25°C, 1 Circuit)	$\Delta P_C / ^\circ\text{C}$	-1.5	-1.0	mW / °C
	Junction Temperature	T _j	125		°C
	Storage Temperature Range	T _{stg}	-55~150		°C
Operating Temperature Range		P _{opr}	-55~100		°C
Lead Soldering Temperature		T _{sol}	260 (10s)		°C
Total Package Power Dissipation (1 Circuit)		P _T	250	150	mW
Total Package Power Dissipation Derating (Ta ≥ 25°C, 1 Circuit)		$\Delta P_T / ^\circ\text{C}$	-2.5	-1.5	mW / °C
Isolation Voltage (Note 1)		BV _S	5000 (AC, 1min., RH ≤ 60%)		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 (Ta = 25°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	$V_{(BR)CEO}$	$I_C = 0.5\text{mA}$	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}	$V = 0, f = 1\text{MHz}$	—	12	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I_C / I_F	$I_F = 1\text{mA}, V_{CE} = 0.5\text{V}$ Rank BV	100	—	1200	%
			200	—	1200	
Low Input CTR	I_C / I_F (low)	$I_F = 0.5\text{mA}, V_{CE} = 1.5\text{V}$ Rank BV	50	—	—	%
			100	—	—	
Collector-Emitter Saturation Voltage	V_{CE} (sat)	$I_C = 0.5\text{mA}, I_F = 1\text{mA}$	—	—	0.4	V
		$I_C = 1\text{mA}, I_F = 1\text{mA}$	—	0.2	—	
		Rank BV	—	—	0.4	

COUPLED ELECTRICAL CHARACTERISTICS (Ta = -25°C~75°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I_C / I_F	$I_F = 1\text{mA}, V_{CE} = 0.5\text{V}$ Rank BV	50	—	—	%
			100	—	—	
Low Input CTR	I_C / I_F (low)	$I_F = 0.5\text{mA}, V_{CE} = 1.5\text{V}$ Rank BV	—	50	—	%
			—	100	—	

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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	$V_S = 500\text{V}$	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

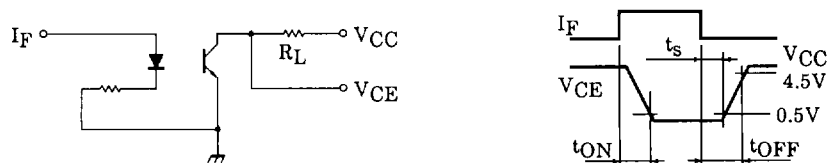
SWITCHING CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	t_r	$V_{CC} = 10\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega$	—	8	—	μs
Fall Time	t_f		—	8	—	
Turn-on Time	t_{on}		—	10	—	
Turn-off Time	t_{off}		—	8	—	
Turn-on Time	t_{ON}	$R_L = 4.7\text{k}\Omega$ (Fig.1) $V_{CC} = 5\text{V}, I_F = 1.6\text{mA}$	—	10	—	μs
Storage Time	t_s		—	50	—	
Turn-off Time	T_{OFF}		—	300	—	

RECOMMENDED OPERATING CONDITIONS

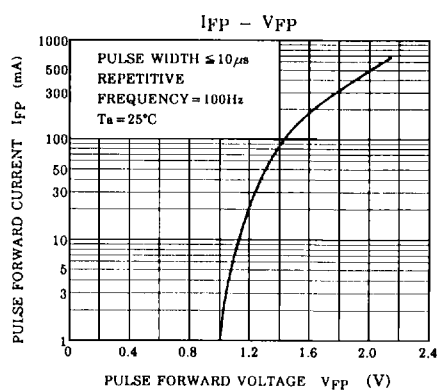
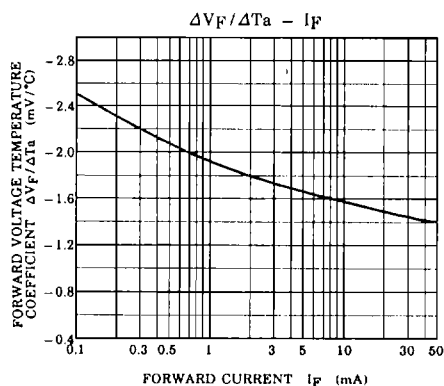
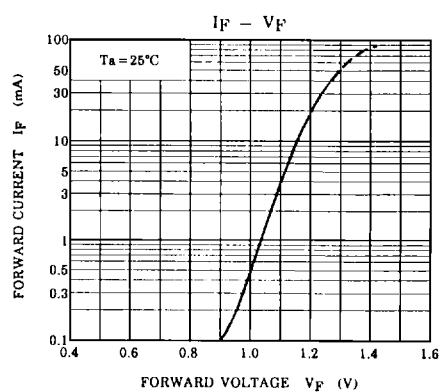
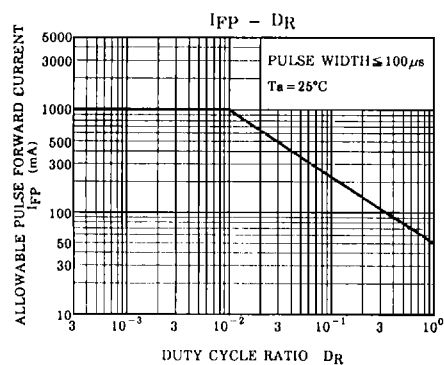
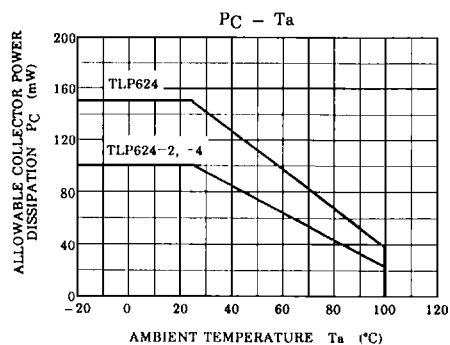
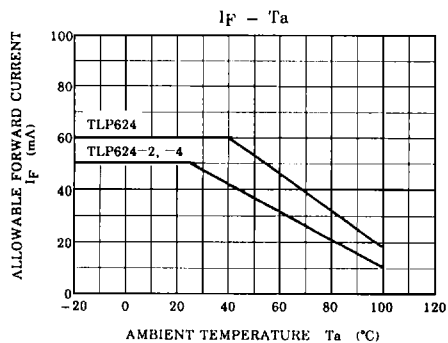
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	—	5	24	V
Forward Current	I_F	—	1.6	20	mA
Collector Current	I_C	—	1	10	mA
Operating Temperature	T_{opr}	-25	—	75	$^\circ\text{C}$

Fig. 1 SWITCHING TIME TEST CIRCUIT

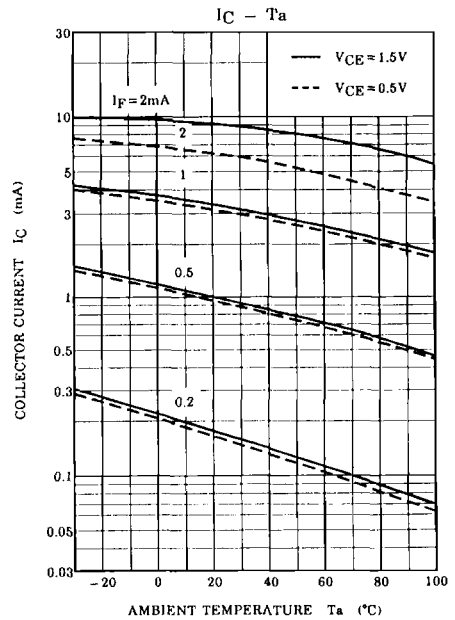
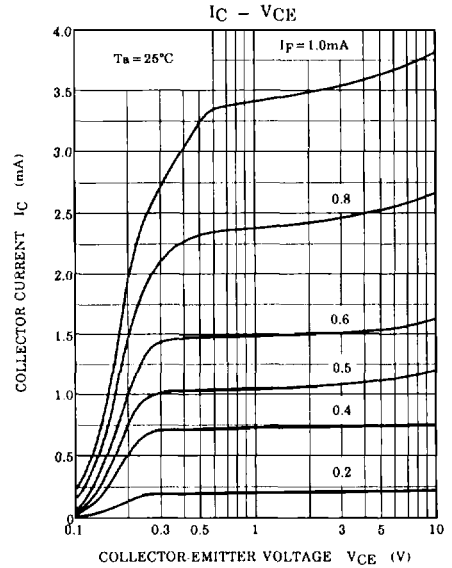
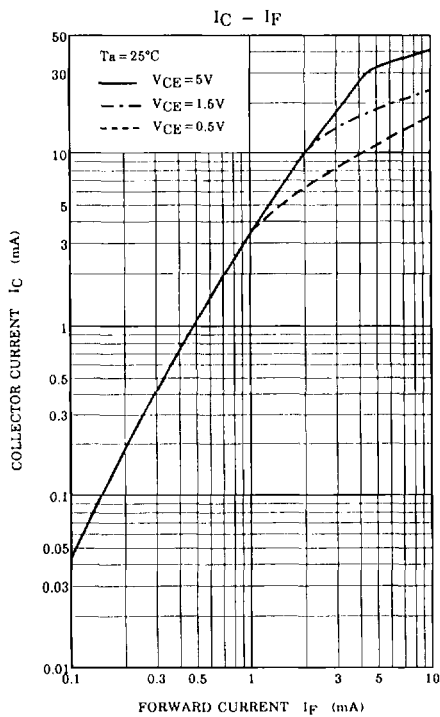
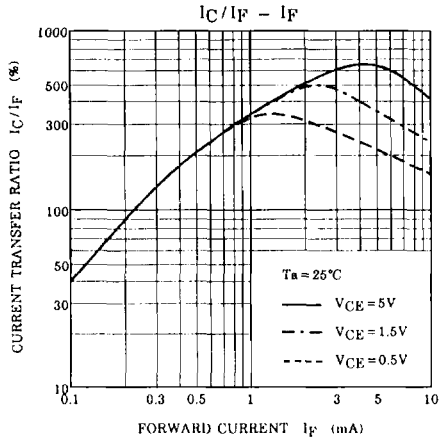


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