SEMICONDUCTOR TOSHIBA

TECHNICAL DATA

TOSHIBA PHOTOCOUPLER

TLP620, TLP620-2, TLP620-4

GaAs IRED & PHOTO-TRANSISTOR

PROGRAMMABLE CONTROLLERS

AC/DC-INPUT MODULE

TELECOMMUNICATION

The TOSHIBA TLP620, -2 and -4 consists of a photo-transistor optically coupled to two gallium arsenide infrared emitting diode connected in inverse parallel.

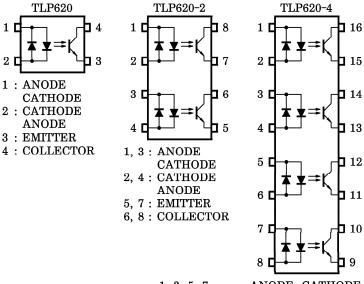
The TLP620-2 offers two isolated channels in an eight lead plastic DIP package, while the TLP620-4 provides four isolated channels in a sixteen plastic DIP package.

Collector-Emitter Voltage : 55V (Min.)

Current Transfer Ratio : 50% (Min.)

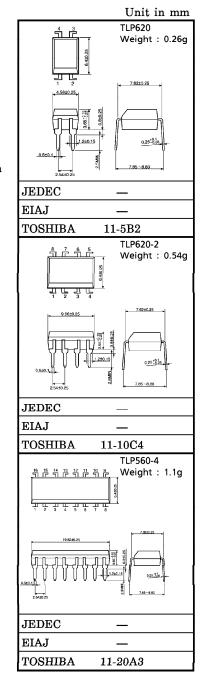
Rank GB : 100% (Min.)

PIN CONFIGURATIONS (TOP VIEW)



: ANODE, CATHODE 1, 3, 5, 7 2, 4, 6, 8 : CATHODE, ANODE 9, 11, 13, 15 : EMITTER

10, 12, 14, 16 : COLLECTOR



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SEMICONDUCTOR **TOSHIBA**

TECHNICAL DATA

TLP620, TLP620-2, TLP620-4

(TLP620)

• UL Recognized : UL1577, File No. E67349

 $\bullet \quad \text{Isolation Voltage} \qquad : 5000 V_{\mbox{rms}} \mbox{(Min.)}$

• Option (D4) type

VDE Approved : DIN VDE0884/08.87, Certificate No. 68384

Maximum Operating Insulation Voltage : 630VpK Highest Permissible Over Voltage : 6000VpK

(Note) When a VDE0884 approved type is needed,

please designate the "Option (D4)".

Creepage Distance : 6.4mm (Min.)
Clearance : 6.4mm (Min.)
Insulation Thickness : 0.4mm (Min.)

MAXIMUM RATINGS (Ta = 25°C)

	CITA DA COMPINIONIO	GILLEDOI	RAT			
	CHARACTERISTIC	SYMBOL	TLP620	TLP620-2 TLP620-4	UNIT	
	Forward Current	I _F (RMS)	60	50	mA	
	Forward Current Derating	ΔI _F /°C	$-0.7 (\mathrm{Ta} \ge 39^{\circ}\mathrm{C})$	-0.5 (Ta \geq 25°C)	mA/°C	
LED	Pulse Forward Current	IFP	$1(100\mu\mathrm{s}$ pu	lse, 100pps)	100pps) A	
1	Power Dissipation (1 Circuit)	$P_{\mathbf{D}}$	100	70	mW	
	Power Dissipation Derating	ΔPD/°C	-1.0	-0.7	mW/°C	
	Junction Temperature	$T_{\rm j}$	1	25	°C	
	Collector-Emitter Voltage	v_{CEO}	55		V	
	Emitter-Collector Voltage	v_{ECO}	7		V	
OR	Collector Current	$I_{\mathbf{C}}$	50		mA	
DETECTOR	Collector Power Dissipation (1 Circuit)	PC	150	100	mW	
	Collector Power Dissipation Derating (1 Circuit) (Ta≥25°C)	△P _C /°C	-1.5	-1.0	mW/°C	
	Junction Temperature	$T_{\rm j}$	1	25	°C	
Sto	rage Temperature Range	$\mathrm{T_{stg}}$	-55~150		°C	
Op	erating Temperature Range	$T_{ m opr}$	-55~100		°C	
Lea	nd Soldering Temperature	${ m T_{sold}}$	260 (10s)		°C	
Tot	al Package Power Dissipation	P_{T}	250	150	mW	
	al Package Power Dissipation rating (Ta≥25°C, 1 Circuit)	$\Delta P_{\mathrm{T}}/^{\circ}\mathrm{C}$	-2.5	-1.5	mW/°C	
Iso	lation Voltage	$BV_{\mathbf{S}}$	5000 (AC, 1 min., RH≤60%)		V_{rms}	

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TLP620, TLP620-2, TLP620-4

TECHNICAL DATA

(TLP620)

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
	Forward Voltage	$V_{\mathbf{F}}$	$I_F = \pm 10 mA$	1.0	1.15	1.3	V
LED	Forward Current	$I_{\mathbf{F}}$	$V_{\mathbf{F}} = \pm 0.7 V$	1	2.5	20	μ A
	Capacitance	C_{T}	V=0, $f=1MHz$	I	60	_	pF
	Collector-Emitter Breakdown Voltage	V (BR) CEO	$I_{\mathrm{C}}\!=\!0.5\mathrm{mA}$	55	_	-	V
DETECTOR	Emitter-Collector Breakdown Voltage	V _{(BR)ECO}	$I_{ m E}\!=\!0.1{ m mA}$	7	_	_	v
TE	Collector Dark Current	Iana	$V_{ m CE}$ = 24 V		10	100	nA
DE	Confector Dark Current	ICEO	$V_{CE}=24V$, $Ta=85$ °C	1	2	50	μ A
	Capacitance (Collector to Emitter)	CCE	$V_{ ext{CE}}$ =0, f=1MHz		10	_	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	$I_{\mathbf{C}}/I_{\mathbf{F}}$	I _F =±5mA, V _{CE} =5V Rank GB	50	_	600	%
		Rank GB	100	_	600	
Saturated CTR	Id/In/	$I_F = \pm 1 \text{mA}, \ V_{CE} = 0.4 \text{V}$		60	<u> </u>	- %
Saturated CTR	IC/IF(sat)	Rank GB	30	_	_	10
		$I_C=2.4mA$, $I_F=\pm 8mA$	I	_	0.4	
Collector-Emitter Saturation Voltage	V _{CE} (sat)	$I_{\rm C} = 0.2 {\rm mA}, \ I_{\rm F} = \pm 1 {\rm mA}$	I	0.2	_	V
Volume		Rank GB	I	_	0.4	
Off-State Collector Current	I _{C (off)}	$V_{F} = \pm 0.7V, \ V_{CE} = 24V$		1	10	μ A
CTR Symmetry	I _{C (ratio)}	$I_{C}(I_{F} = -5mA) / I_{C}(I_{F} = +5mA)$	0.33	1	3	_

ISOLATION CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	c_{S}	V _S =0, f=1MHz	_	0.8	_	pF
Isolation Resistance	$R_{\mathbf{S}}$	$V_S = 500V$	5×10^{10}	1014	_	Ω
		AC, 1 minute	5000	_	_	**
Isolation Voltage	$BV_{\mathbf{S}}$	AC, 1 second, in oil	_	10000	_	$V_{ m rms}$
		DC, 1 minute, in oil	_	10000	_	V_{dc}

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TECHNICAL DATA

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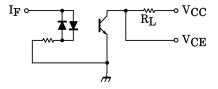
SWITCHING CHARACTERISTICS (Ta = 25°C)

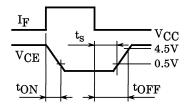
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	$\mathbf{t_r}$			2		
Fall Time	$\mathbf{t_f}$	$V_{ m CC}$ = 10V $I_{ m C}$ = 2mA	_	3		
Turn-on Time	ton	$1C = 2mA$ $R_{L} = 100\Omega$		3		μ s
Turn-off Time	$t_{ m off}$	- . 1		3		
Turn-on Time	ton	D 1010(E: 1)	_	2		
Storage Time	$t_{\mathtt{s}}$	$R_L=1.9k\Omega$ (Fig.1) $V_{CC}=5V$, $I_F=\pm 16mA$	_	15	_	μ s
Turn-off Time	tOFF	VCC = 5 V, 1 _F = ± 15mm1	_	25	_	

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	v_{CC}	_	5	24	V
Forward Current	I _{F (RMS)}	_	16	20	mA
Collector Current	IC	_	1	10	mA
Operating Temperature	T_{opr}	-25	_	85	°C

Fig.1 Switching Time Test Circuit



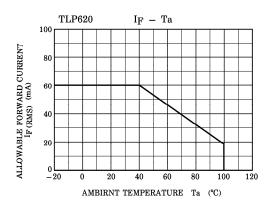


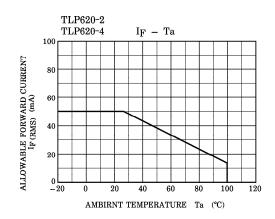
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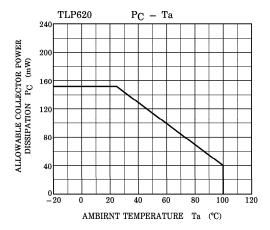
TLP620, TLP620-2, TLP620-4

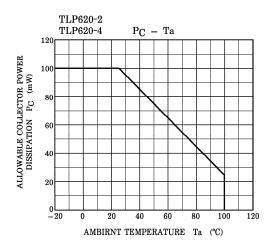
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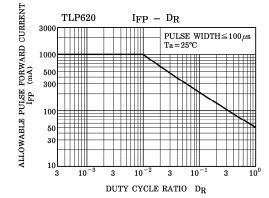
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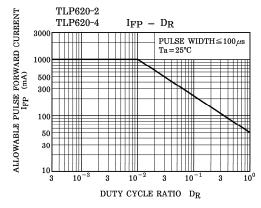








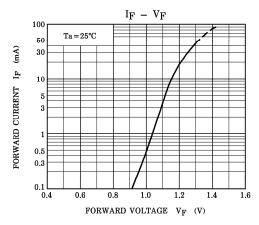


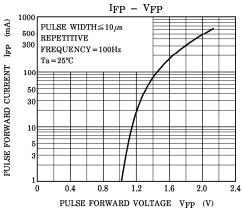


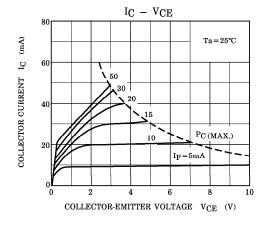
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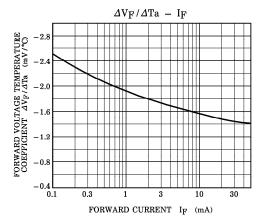
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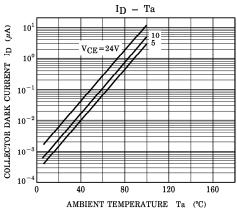
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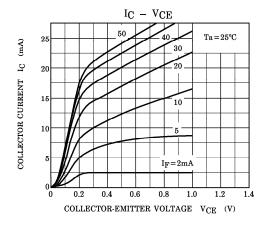






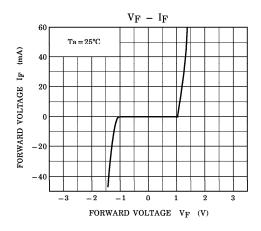


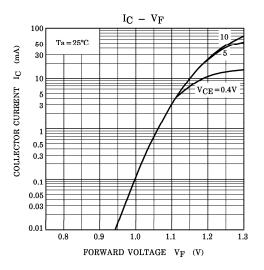


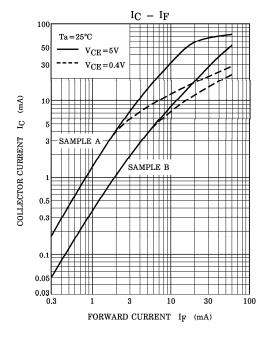


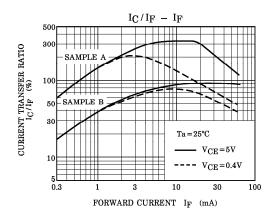
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