

TENTATIVE

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

TLP627A, TLP627A-2, TLP627A-4

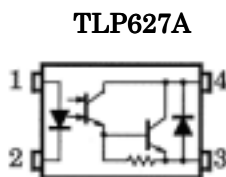
TELECOMMUNICATION
PROGRAMMABLE CONTROLLERS
DC-OUTPUT MODULE

The TOSHIBA TLP627A, -2, and -4 consist of a gallium arsenide infrared emitting diode optically coupled to a darlington connected phototransistor which has a 350V high voltage of collector-emitter breakdown voltage.

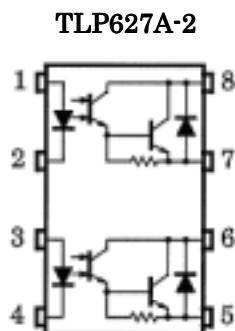
The TLP627A-2 offer two isolated channels in a eight lead plastic DIP package, while the TLP627A-4 provide four isolated channels per package.

- Collector-Emitter Voltage : 350V(MIN)
- Current Transfer Ratio : 1500% (MIN)
- Isolation Voltage : 5000Vrms(MIN)

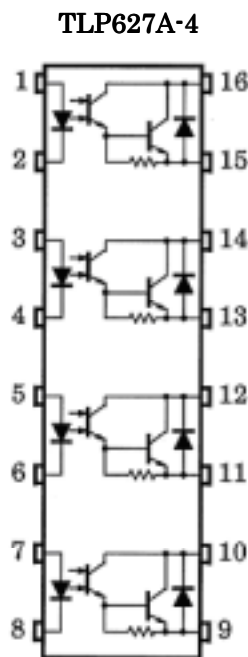
PIN CONFIGURATION (TOP VIEW)



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

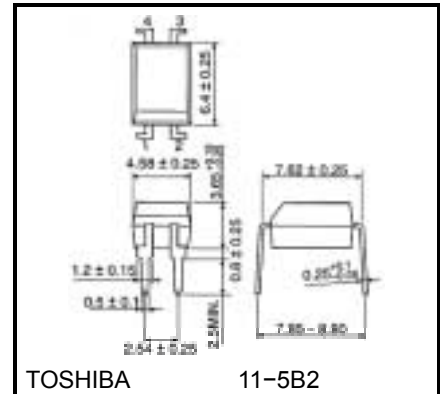


1, 3 : ANODE
2, 4 : CATHODE
5, 7 : EMITTER
6, 8 : COLLECTOR

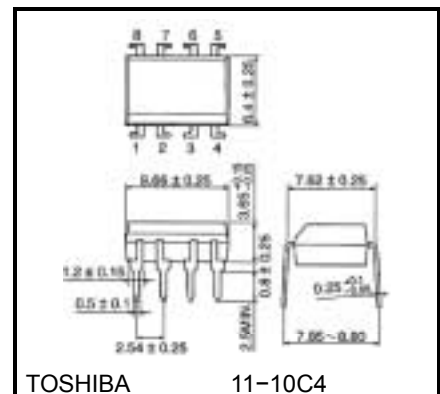


1, 3, 5, 7 : ANODE
2, 4, 6, 8 : CATHODE
9, 11, 13, 15 : EMITTER
10, 12, 14, 16 : COLLECTOR

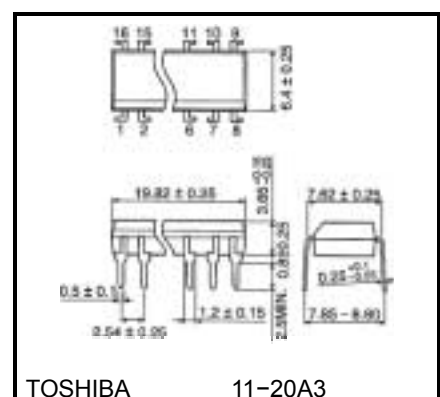
単位: mm



TOSHIBA 11-5B2
Weight : 0.26 g



TOSHIBA 11-10C4
Weight : 0.54 g



TOSHIBA 11-20A3
Weight : 1.1 g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTICS		SYMBOL	RATING		UNIT
			TLP627A	TLP627A-2 TLP627A-4	
LED	Forward Current	I_F	60	50	mA
	Forward Current Derating	$\Delta I_F / ^\circ\text{C}$	-0.7 (Ta ≥ 39°C)	-0.5 (Ta ≥ 25°C)	mA / °C
	Pulse Forward Current	I_{FP}	1 (100 μs Pulse, 100 pps)		A
	Reverse Voltage	V_R	5		V
DETECTOR	Collector-Emitter Voltage	V_{CEO}	350		V
	Emitter-Collector Voltage	V_{ECO}	0.3		V
	Collector Current	I_C	150		mA
	Collector Power Dissipation (1 circuit)	P_C	150 (300) (*)	100	mW
	Collector Power Dissipation Derating (Ta ≥ 25°C, 1 Circuit)	$\Delta P_C / ^\circ\text{C}$	-1.5 (-3.5) (*)	-1.0	mW / °C
Storage Temperature Range		T_{stg}	-55 ~ 125		°C
Operating Temperature Range		T_{opr}	-55 ~ 100		°C
Lead Soldering Temperature		T_{sol}	260 (10 sec)		°C
Total Package Power Dissipation (1 circuit)		P_T	250 (320) (*)	150	mW
Total Package Power Dissipation Derating (Ta ≥ 25°C, 1 circuit)		$\Delta P_T / ^\circ\text{C}$	-2.5 (-3.2) (*)	-1.5	mW / °C
Isolation Voltage		BV_S	5000 (AC, 1 min, R.H. ≤ 60%) (**)		Vrms

* : $I_F = 20 \text{ mA max}$

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

RECOMMENDED OPERATING CONDISIONS

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	—	—	200	V
Forward Current	I_F	—	16	25	mA
Collector Current	I_C	—	—	120	mA
Operating Temperature	T_{opr}	-25	—	85	°C

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTICS		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V _F	I _F = 10 mA	1.0	1.15	1.3	V
	Reverse Current	I _R	V _R = 5 V	—	—	10	μ A
	Capacitance	C _T	V = 0, f = 1 MHz	—	30	—	pF
DETECTOR	Collector-Emitter Breakdown Voltage	V _(BR) CEO	I _C = 0.1 mA	350	—	—	V
	Emitter-Collector Breakdown Voltage	V _(BR) ECO	I _E = 0.1 mA	0.3	—	—	V
	Collector Dark Current	I _{CEO}	V _{CE} = 300 V	—	10	200	nA
			V _{CE} = 300 V, Ta = 85°C	—	—	20	μ A
	Capacitance Collector to Emitter	C _{CCE}	V = 0, f = 1 MHz	—	10	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I_C / I_F	$I_F = 1 \text{ mA}$, $V_{CE} = 1 \text{ V}$	1500	4000	—	%
Saturated CTR	$I_C / I_F (\text{sat})$	$I_F = 10 \text{ mA}$, $V_{CE} = 1 \text{ V}$	500	—	—	%
Collector-Emitter Saturation Voltage	$V_{CE (\text{sat})}$	$I_C = 15 \text{ mA}$, $I_F = 1 \text{ mA}$	—	—	1.0	V
		$I_C = 100 \text{ mA}$, $I_F = 10 \text{ mA}$	0.3	—	1.2	

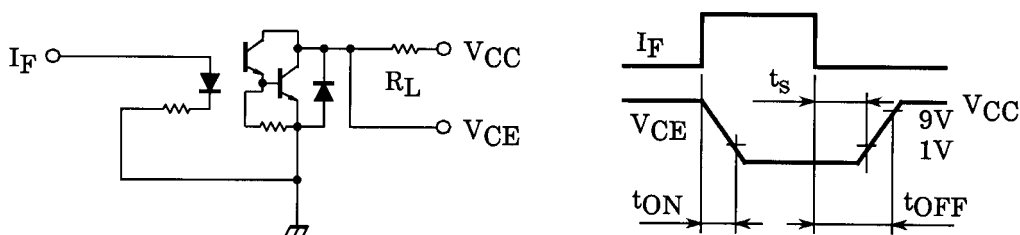
ISOLATION CHARACTERISTICS (Ta = 25°C)

CHARACTERISTICS	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^{12}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	5000	—	—	Vrms
		AC, 1 second, in oil	—	10000	—	
		DC, 1 second, in oil	—	10000	—	Vdc

SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	t_r	$V_{CC} = 10 \text{ V}$ $I_C = 10 \text{ mA}$ $R_L = 100 \Omega$	—	40	—	μs
Fall Time	t_f		—	15	—	
Turn-on Time	t_{on}		—	50	—	
Turn-off Time	t_{off}		—	15	—	
Turn-on Time	t_{ON}	$R_L = 180 \Omega$ $V_{CC} = 10 \text{ V}$, $I_F = 16 \text{ mA}$ (Fig.1)	—	5	—	μs
Storage Time	t_s		—	40	—	
Turn-off Time	t_{OFF}		—	80	—	

Fig.1: SWITCHING TIME TEST CIRCUIT



RESTRICTIONS ON PRODUCT USE

000707EBC

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In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
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