TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

TLP281,TLP281-4

PROGRAMMABLE CONTROLLERS AC/DC-INPUT MODULE PC CARD MODEM(PCMCIA)

TLP281 and TLP281-4 is a very small and thin coupler, suitable for surface mount assembly in applications such as PCMCIA Fax modem, programmable controllers.

TLP281 and TLP281-4 consist of photo transistor, optically coupled to a gallium arsenide infrared emitting diode.

Collector-Emitter Voltage : 80 V (MIN)
 Current Transfer Ratio : 50% (MIN)
 Rank GB : 100% (MIN)
 Isolation Voltage : 2500 Vrms (MIN)

• UL Recognized : UL1577 , File No. E67349

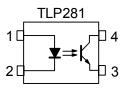
BSI Approved : BS EN 60065: 2002,

: BS EN 60950-1: 2002 Certificate No. 8143, 8144

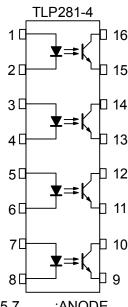
Unit in mm TLP281 1 2 2.6 ± 0.25 0.4 ± 0.1 1.27 ± 0.2 TOSHIBA — Unit in mm TLP281

Weight: 0.05 g

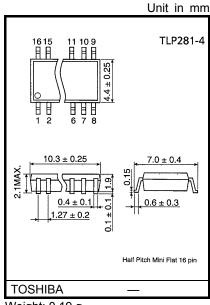
Pin Configuration (top view)



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



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



Weight: 0.19 g

TYPE	Classi- Fication(*1)	(I _C	fer Ration (%) / I _F) = 5 V, Ta = 25°C	Marking of Classification		
		Min	Max			
	Blank	50	600	Blank ,Y [®] ,YE,G,G [®] ,GR,B,BL,GB		
	Rank Y	50	150	YE		
	Rank GR	100	300	GR		
	Rank BL	200	600	BL		
TLP281	Rank GB	100	600	GB		
	Rank YH	75	150	Y=		
	Rank GRL	100	200	G		
	Rank GRH	150	300	G [•]		
	Rank BLL	200	400	В		
TLP281-4	Blank	50	600	Blank , GB		
1LF 201-4	Rank GB	100	600	GB		

^{*1:} Ex. rank GB: TLP281 (GB)

(Note): Application type name for certification test, please use standard product type name, i.e. TLP281 (GB): TLP281-1, TLP281-4 (GB): TLP281-4

Absolute Maximum Ratings (Ta = 25°C)

TOSHIBA

CHARACTERISTIC		SYMBOL	RAT	UNIT		
		STIMBOL	TLP281	TLP281-4	01411	
Forward Current		lF	50		mA	
	Forward Current Derating	ΔI _F /°C	−0.7 (Ta≥53°C)	−0.5 (Ta≥25°C)	mA /°C	
ED	Pulse Forward Current	I _{FP}	1		Α	
	Reverse Voltage	V _R	ţ	5		
	Junction Temperature	Tj	12	25	°C	
	Collector-Emitter Voltage	V _{CEO}	8	0	V	
	Emitter-Collector Voltage	V _{ECO}	-	V		
N	Collector Current	IC	50		mA	
DETECTOR	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	Tj	125		°C	
Оре	erating Temperature Range	T _{opr}	-55~100		°C	
Storage Temperature Range		T _{stg}	-55~125		°C	
Lead Soldering Temperature		T _{sol}	260 (10s)		°C	
Total Package Power Dissipation (1 Circuit)		PT	200	170	mW	
	al Package Power Dissipation ating (Ta≥25°C) (1 Circuit)	ΔP _T /°C	-2.0 -1.7		mW /°C	
Isol	ation Voltage (Note1)	BV_S	2500(AC,1mi	in,R.H.≤60%)	Vrms	

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

(Note1) Device considered a two terminal device : LED side pins shorted together and DETECTOR side pins shorted together.

Individual Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
	Forward Voltage	V _F	I _F = 10 mA	1.0	1.15	1.3	V
LED	Reverse Current	I _R	V _R = 5 V	_	_	10	μΑ
	Capacitance	C _T	V = 0, f = 1 MHz	_	30	_	pF
	Collector-Emitter Breakdown Voltage	V _(BR) CEO	I _C = 0.5 mA	80	_		V
TOR	Emitter-Collector Breakdown Voltage	V _(BR) ECO	I _E = 0.1 mA	7	_	_	V
DETECTOR	Collector Dark Current (Note2)	ICEO	V _{CE} = 48 V, Ambient Light Below (100 &x)	_	0.01 (2)	0.1 (10)	μΑ
			V _{CE} = 48 V, Ta = 85°C Ambient Light Below (100 tx)	_	2 (4)	50 (50)	μΑ
	Capacitance (Collector to Emitter)	C _{CE}	V = 0, f = 1 MHz	_	10	_	pF

(Note 2) Because of the construction,leak current might be increased by ambient light.

Please use photocoupler with less ambient light.

Coupled Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I _C / I _F	I _F = 5 mA, V _{CE} = 5 V	50	_	600	- %
Current Transfer Natio		Rank GB	100	_	600	
Saturated CTR	I _C / I _{F (sat)}	IF = 1 mA, VCE = 0.4 V		60	_	%
Saluraled CTK		Rank GB	30	_	_	/0
Collector-Emitter		I _C = 2.4 mA, I _F = 8 mA	_	_	0.4	
Saturation Voltage	V _{CE} (sat)	I _C = 0.2 mA, I _F = 1 mA	_	0.2	_	٧
Saturation voltage		Rank GB	_	_	0.4	
Off-State Collector Current	I _{C (off)}	V _F = 0.7 V, V _{CE} = 48 V		_	10	μΑ

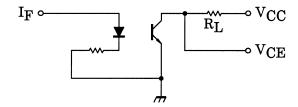
Isolation Characteristics (Ta = 25°C)

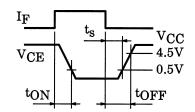
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance (Input to Output)	CS	V _S = 0 V, f = 1 MHz	_	0.8	_	pF
Isolation Resistance	R _S	V _S = 500 V, R.H.≤60%	5×10 ¹⁰	10 ¹⁴	_	Ω
	BV _S AC , 1 minute AC , 1 second,in OIL DC , 1 minute, in OIL	AC , 1 minute	2500	_	_	Vrms
Isolation Voltage		AC , 1 second,in OIL	_	5000	_	VIIIIS
		_	5000	_	Vdc	

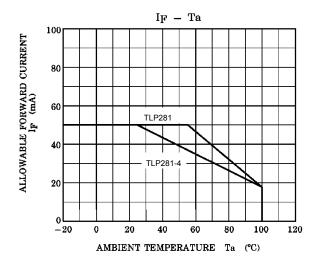
Switching Characteristics (Ta = 25°C)

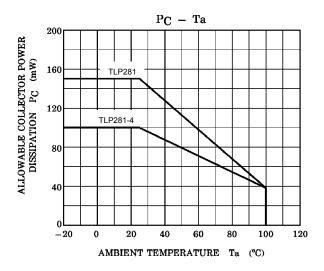
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	t _r		_	2	_	
Fall Time	t _f	V _{CC} = 10 V, I _C = 2 mA	_	3	_	116
Turn-On Time	t _{on}	$R_L = 100\Omega$	_	3	_	μs
Turn-Off Time	t _{off}		_	3	_	
Turn-On Time	t _{ON}		_	2	_	
Storage Time	ts	R_L = 1.9 kΩ (Fig.1) V_{CC} = 5 V, I_F = 16 mA	_	25	_	μs
Turn-Off Time	toff		_	40	_	

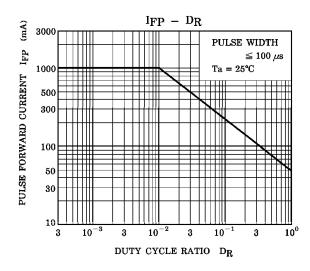
(Fig.1)SWITCHING TIME TEST CIRCUIT

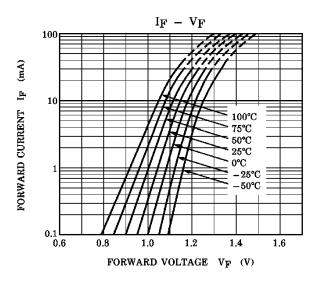


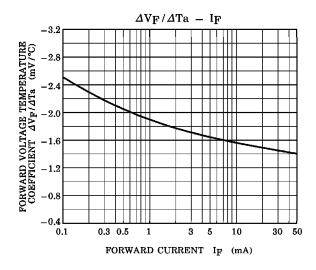


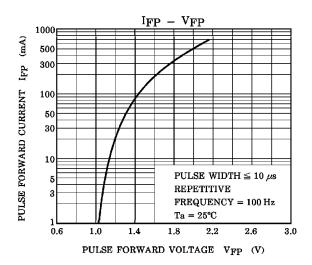


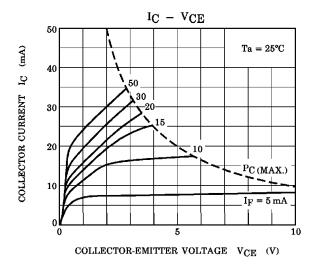


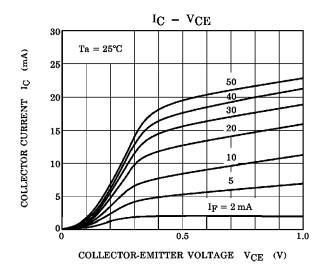


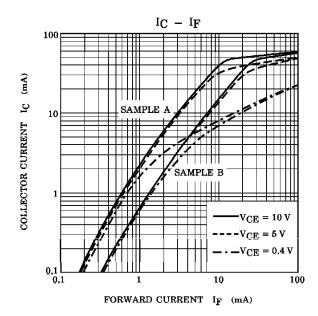


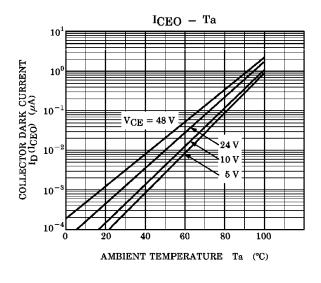


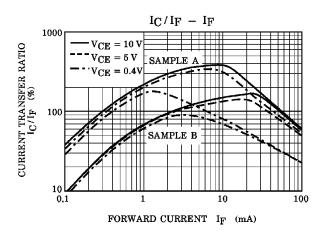




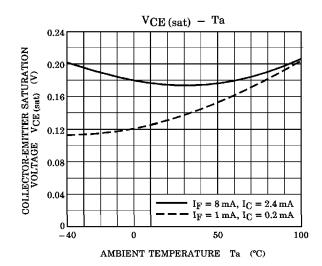


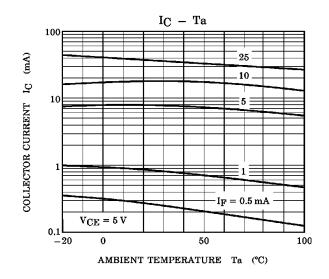


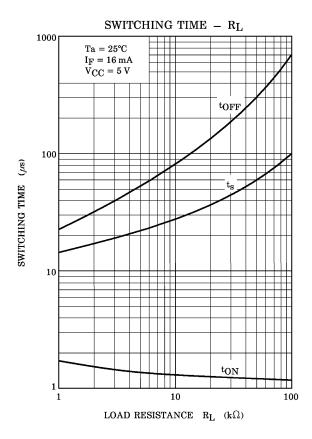


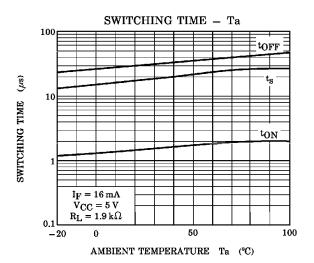


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20070701-EN

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