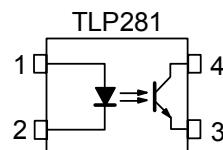


TLP281,TLP281-4

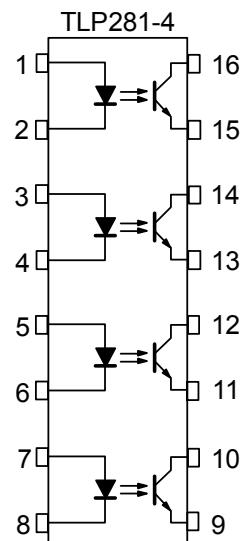
**PROGRAMMABLE CONTROLLERS
AC/DC-INPUT MODULE
PC CARD MODEM(PCMCIA)**

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.

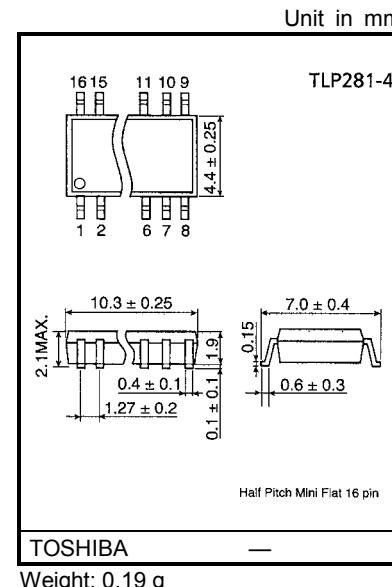
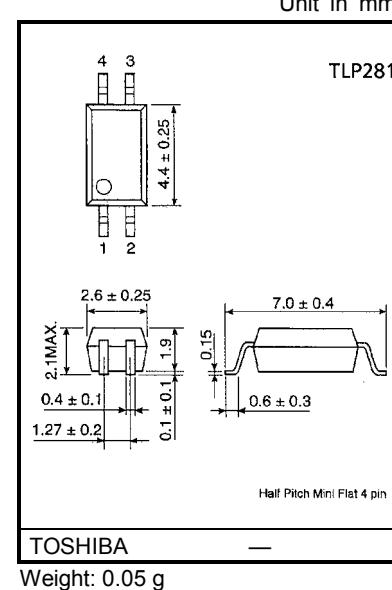
TLP281 and TLP281-4 consist of photo transistor, optically coupled to a gallium arsenide infrared emitting diode.



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



TYPE	Classi- Fication(*1)	Current Transfer Ration (%) (I_C / I_F)		Marking of Classification	
		$I_F = 5 \text{ mA}, V_{CE} = 5 \text{ V}, Ta = 25^\circ\text{C}$			
		Min	Max		
TLP281	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	
	Rank GB	100	600	GB	
	Rank YH	75	150	Y [■]	
	Rank GRL	100	200	G	
	Rank GRH	150	300	G [■]	
	Rank BLL	200	400	B	
TLP281-4	Blank	50	600	Blank , GB	
	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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING		UNIT
		TLP281	TLP281-4	
LED	Forward Current	I _F	50	mA
	Forward Current Derating	ΔI _F /°C	-0.7 (Ta≥53°C) -0.5 (Ta≥25°C)	mA /°C
	Pulse Forward Current	I _{FP}	1	A
	Reverse Voltage	V _R	5	V
	Junction Temperature	T _j	125	°C
DETECTOR	Collector-Emitter Voltage	V _{CEO}	80	V
	Emitter-Collector Voltage	V _{ECO}	7	V
	Collector Current	I _C	50	mA
	Collector Power Dissipation (1 Circuit)	P _C	150	mW
	Collector Power Dissipation Derating(Ta≥25°C) (1 Circuit)	ΔP _C /°C	-1.5	-1.0
	Junction Temperature	T _j	125	°C
Operating 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)		P _T	200	170
Total Package Power Dissipation Derating (Ta≥25°C) (1 Circuit)		ΔP _T /°C	-2.0	-1.7
Isolation Voltage (Note1)	B _{VS}	2500(AC,1min,R.H.≤60%)		V _{rms}

(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
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	μA
	Capacitance	C _T	V = 0, f = 1 MHz	—	30	—	pF
DETECTOR	Collector-Emitter Breakdown Voltage	V _{(BR) CEO}	I _C = 0.5 mA	80	—	—	V
	Emitter-Collector Breakdown Voltage	V _{(BR) ECO}	I _E = 0.1 mA	7	—	—	V
	Collector Dark Current (Note2)	I _{CEO}	V _{CE} = 48 V, Ambient Light Below (100 lx)	—	0.01 (2)	0.1 (10)	μA
			V _{CE} = 48 V, Ta = 85°C Ambient Light Below (100 lx)	—	2 (4)	50 (50)	μA
	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	$I_F = 5 \text{ mA}, V_{CE} = 5 \text{ V}$ Rank GB	50	—	600	%
			100	—	600	
Saturated CTR	$I_C / I_F(\text{sat})$	$I_F = 1 \text{ mA}, V_{CE} = 0.4 \text{ V}$ Rank GB	—	60	—	%
			30	—	—	
Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C = 2.4 \text{ mA}, I_F = 8 \text{ mA}$	—	—	0.4	V
		$I_C = 0.2 \text{ mA}, I_F = 1 \text{ mA}$ Rank GB	—	0.2	—	
Off-State Collector Current	$I_C(\text{off})$	$V_F = 0.7 \text{ V}, V_{CE} = 48 \text{ V}$	—	—	10	μA

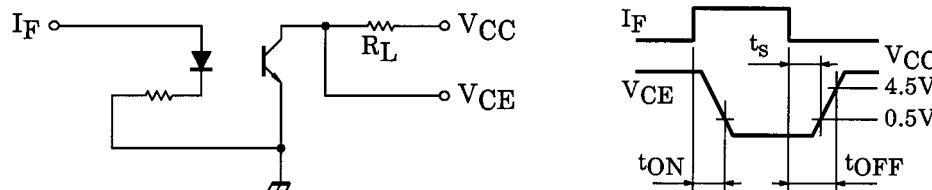
ISOLATION CHARACTERISTICS (Ta = 25°C)

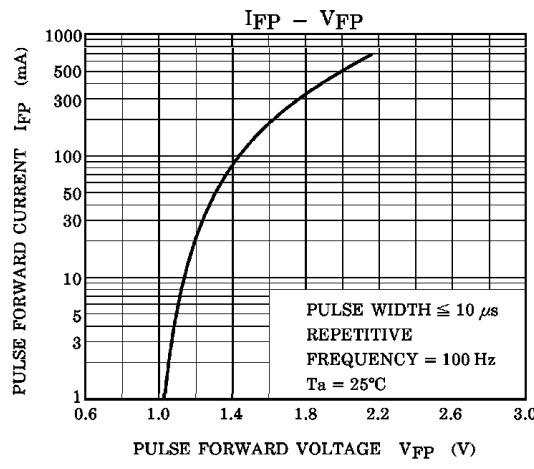
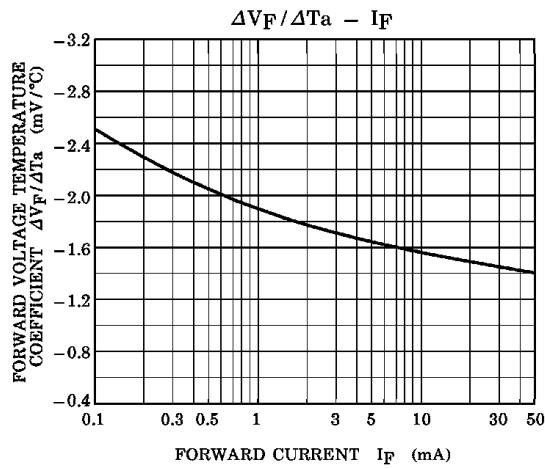
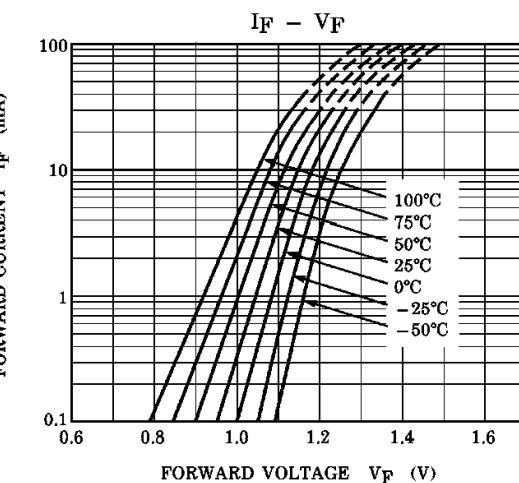
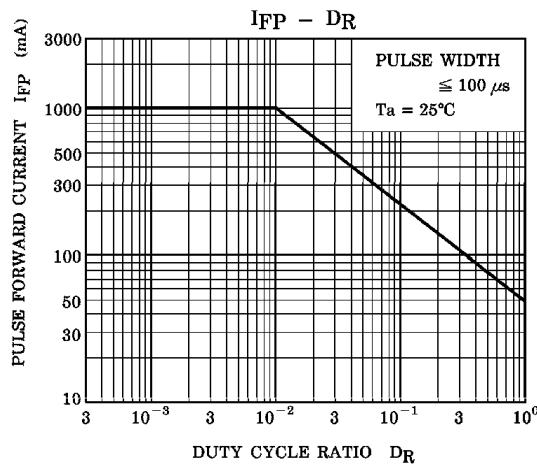
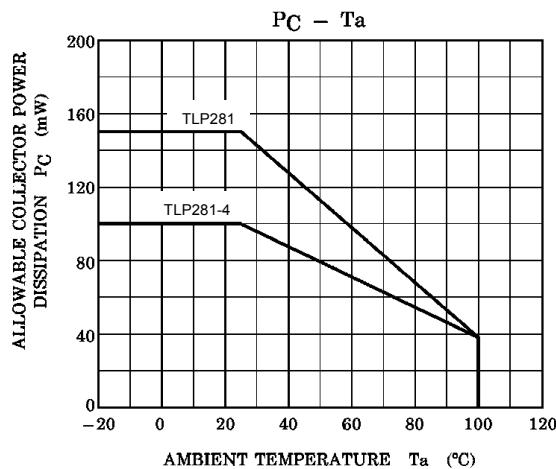
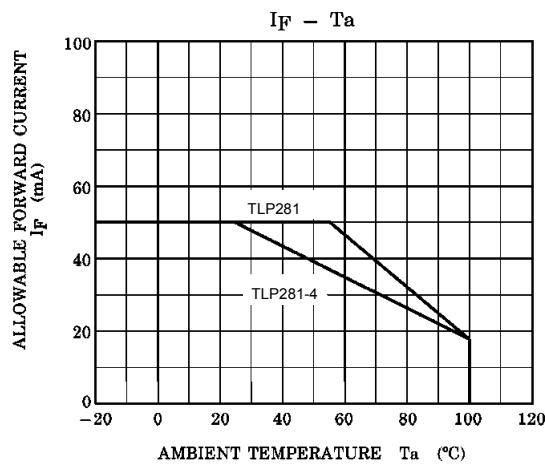
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance (Input to Output)	C_S	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500 \text{ V}, R.H. \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in OIL	—	5000	—	
		DC, 1 minute, in OIL	—	5000	—	Vdc

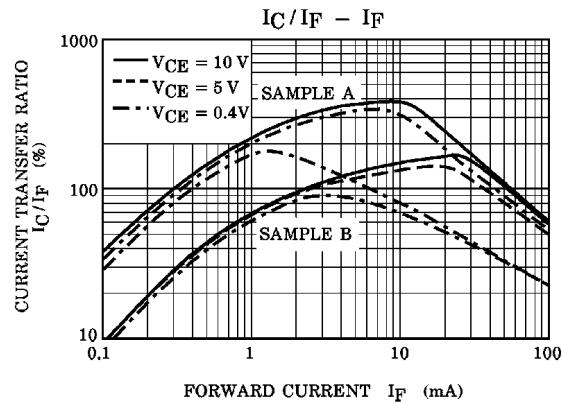
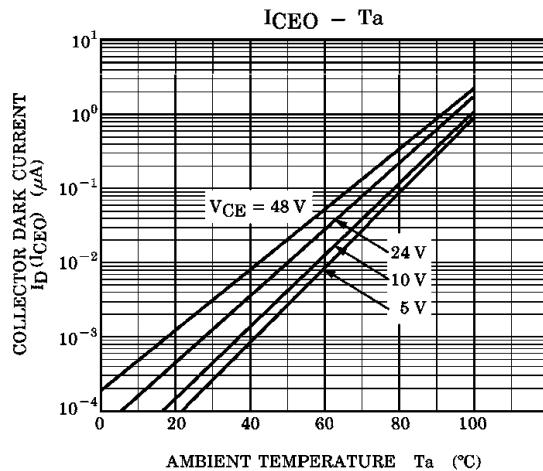
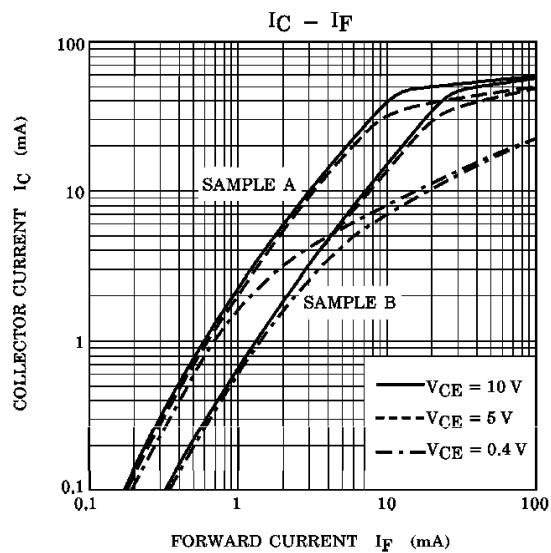
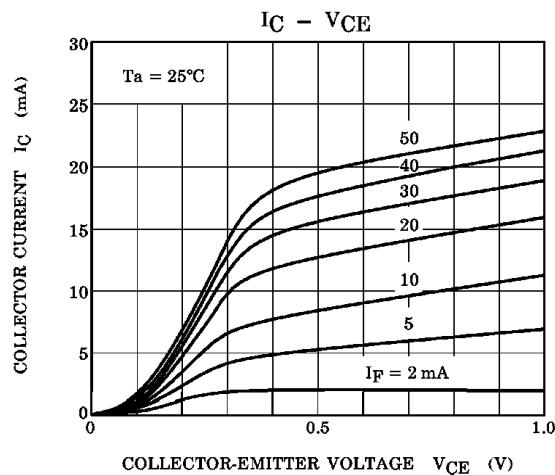
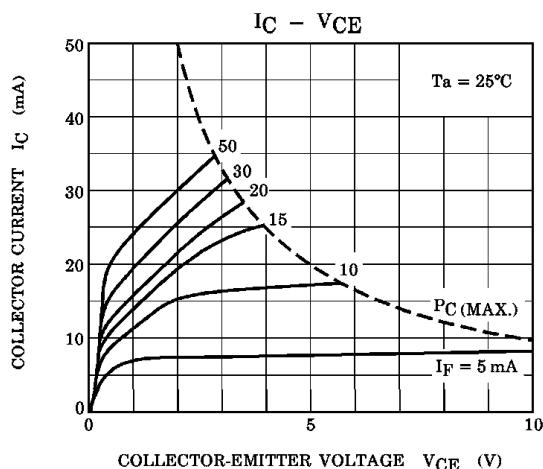
SWITCHING CHARACTERISTICS (Ta = 25°C)

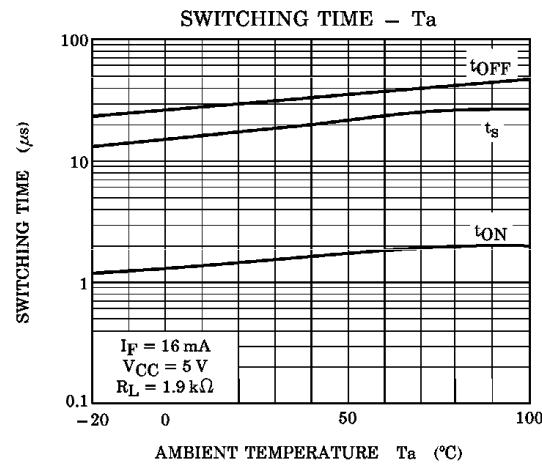
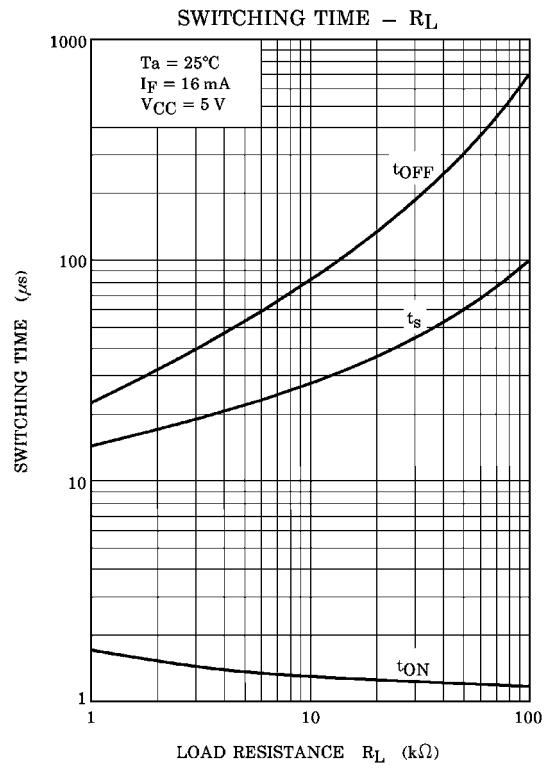
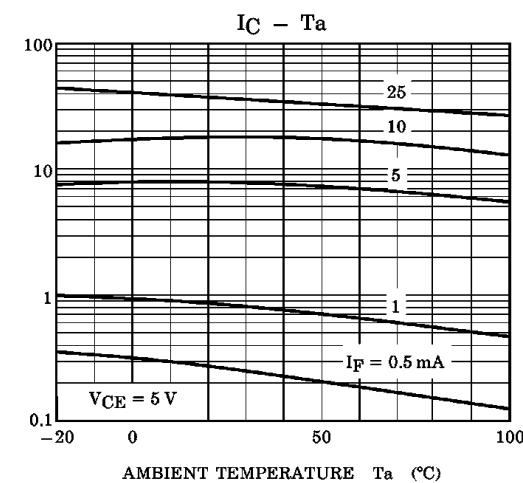
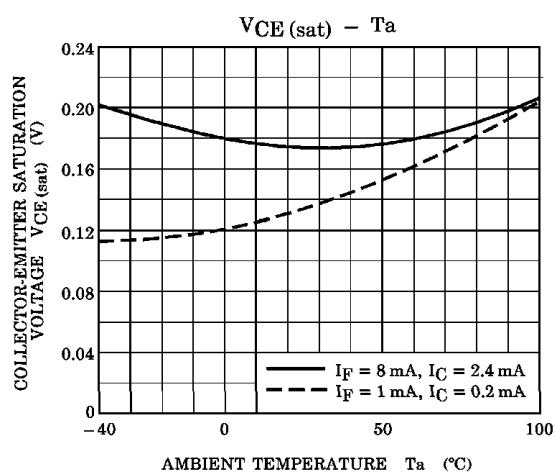
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	t_r	$V_{CC} = 10 \text{ V}, I_C = 2 \text{ mA}$ $R_L = 100\Omega$	—	2	—	μs
Fall Time	t_f		—	3	—	
Turn-On Time	t_{ON}		—	3	—	
Turn-Off Time	t_{OFF}		—	3	—	
Turn-On Time	t_{ON}	$R_L = 1.9 \text{ k}\Omega$ (Fig.1) $V_{CC} = 5 \text{ V}, I_F = 16 \text{ mA}$	—	2	—	μs
Storage Time	t_s		—	25	—	
Turn-Off Time	t_{OFF}		—	40	—	

(Fig.1)SWITCHING TIME TEST CIRCUIT









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