

TLP731, 732

GaAs IRED & PHOTO-TRANSISTOR

OFFICE MACHINE.
HOUSEHOLD USE EQUIPMENT.
SOLID STATE RELAY.
SWITCHING POWER SUPPLY.

The TOSHIBA TLP731 and TLP732 consist of a photo-transistor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

TLP732 is no-base internal connection for high-EMI environments.

- . Collector-Emitter Voltage : 55V Min.
- . Current Transfer Ratio : 50% Min.
- Rank GB : 100% Min.

- . UL Recognized : UL1577, File No. E67349
- . BSI Approved : BS415:1990, BS7002:1989 (EN60950)

Certificate No. 6617

Isolation Voltage : 4000V_{rms} (Min)

- . Option (D4) type

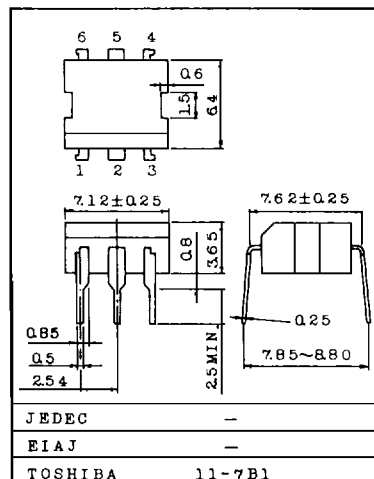
VDE Approved : DIN VDE0884/08.87,
Certificate No. 65640

Maximum Operating Insulation Voltage : 630V_{PK}

Highest Permissible Over Voltage : 6000V_{PK}

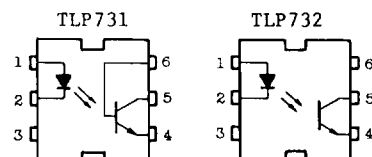
(Note) When a VDE0884 approved type is needed, please designate the " Option (D4) "

Unit in mm



Weight: 0.35g

PIN CONFIGURATIONS (TOP VIEW)



1: ANODE
2: CATHODE
3: NC
4: EMITTER
5: COLLECTOR
6: BASE

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	7.62mm pitch standard type	10.16mm pitch (LF2) type
. Creepage Distance :	7.0mm (Min)	8.0mm (Min)
Clearance :	7.0mm (Min)	8.0mm (Min)
Insulation Thickness :	0.5mm (Min)	0.5mm (Min)

MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I _F	60	mA
	Forward Current Derating (Ta ≥ 39°C)	ΔI _F /°C	-0.7	mA/°C
	Peak Forward Current (100μs pulse, 100pps)	I _{FP}	1	A
	Power Dissipation	P _D	100	mW
	Power Dissipation Derating (Ta ≥ 25°C)	ΔP _D /°C	-1.0	mW/°C
	Reverse Voltage	V _R	5	V
	Junction Temperature	T _j	125	°C
DETECTOR	Collector-Emitter Voltage	V _{CEO}	55	V
	Collector-Base Voltage (TLP731)	V _{CB0}	80	V
	Emitter-Collector Voltage	V _{ECO}	7	V
	Emitter-Base Voltage (TLP731)	V _{EBO}	7	V
	Collector Current	I _C	50	mA
	Power Dissipation	P _C	150	mW
	Power Dissipation Derating (Ta ≥ 25°C)	ΔP _C /°C	-1.5	mW/°C
	Junction Temperature	T _j	125	°C
Storage Temperature Range		T _{stg}	-55 ~ 150	°C
Operating Temperature Range		T _{opr}	-55 ~ 100	°C
Lead Soldering Temperature (10 sec.)		T _{solid}	260	°C
Total Package Power Dissipation		P _T	250	mW
Total Package Power Dissipation Derating (Ta ≥ 25°C)		ΔP _T /°C	-2.5	mW/°C
Isolation Voltage (AC, 1 min, RH ≤ 60%)		BVS	4000	V _{rms}

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V _F	I _F =10mA	1.0	1.15	1.3	V
	Reverse Current	I _R	V _R =5V	—	—	10	μA
	Capacitance	C _T	V=0, f=1MHz	—	30	—	pF
DETECTOR	Collector-Emitter Breakdown Voltage	V(BR) _{CEO}	I _C =0.5mA	55	—	—	V
	Emitter-Collector Breakdown Voltage	V(BR) _{ECO}	I _E =0.1mA	7	—	—	V
	Collector-Base Breakdown Voltage (TLP731)	V(BR) _{CBO}	I _C =0.1mA	80	—	—	V
	Emitter-Base Breakdown Voltage (TLP731)	V(BR) _{EBO}	I _E =0.1mA	7	—	—	V
	Collector Dark Current	I _{CEO}	V _{CE} =24V	—	10	100	nA
			V _{CE} =24V, Ta=85°C	—	2	50	μA
	Collector Dark Current (TLP731)	I _{CER}	V _{CE} =24V, Ta=85°C R _{BE} =1MΩ	—	0.5	10	μA
	Collector Dark Current (TLP731)	I _{CBO}	V _{CB} =10V	—	0.1	—	nA
	DC Forward Current Gain (TLP731)	h _{FE}	V _{CE} =5V, I _C =0.5mA	—	400	—	—
	Capacitance Collector to Emitter	C _{CE}	V=0, f=1MHz	—	10	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I _C /I _F	I _F =5mA, V _{CE} =5V Rank GB	50	—	600	%
			100	—	600	
Saturated CTR	I _C /I _F (sat)	I _F =1mA, V _{CE} =0.4V Rank GB	—	60	—	%
			30	—	—	
Base Photo-Current (TLP731)	I _{pb}	I _F =5mA, V _{CB} =5V	—	10	—	μA
Collector-Emitter Saturation Voltage	V _{CE} (sat)	I _C =2.4mA, I _F =8mA	—	—	0.4	V
		I _C =0.2mA, I _F =1mA	—	0.2	—	V
		Rank GB	—	—	0.4	V

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	4000	-	-	V_{rms}
		AC, 1 second	-	10000	-	
		DC, 1 minute	-	10000	-	V_{dc}

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	t_r	$V_{CC}=10\text{V}$ $I_C=2\text{mA}$ $R_L=100\Omega$	-	2	-	μs
Fall Time	t_f		-	3	-	
Turn-on Time	t_{on}		-	3	10	
Turn-off Time	t_{off}		-	3	10	
Turn-on Time	t_{ON}	$R_L=1.9\text{k}\Omega$ (Fig.1) $R_{BE}=\text{OPEN}$ $V_{CC}=5\text{V}$, $I_F=16\text{mA}$	-	2	-	μs
Storage Time	t_S		-	15	-	
Turn-off Time	t_{OFF}		-	25	-	
Turn-on Time	t_{ON}	$R_L=1.9\text{k}\Omega$ (Fig.1) $R_{BE}=220\text{k}\Omega$ (TLP731) $V_{CC}=5\text{V}$, $I_F=16\text{mA}$	-	2	-	μs
Storage Time	t_S		-	12	-	
Turn-off Time	t_{OFF}		-	20	-	

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	-	5	24	V
Forward Current	I_F	-	16	25	mA
Collector Current	I_C	-	1	10	mA
Operating Temperature	T_{opr}	-25	-	85	$^\circ\text{C}$

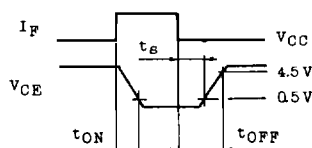
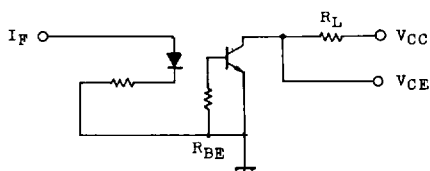


Fig. 1 Switching Time Test Circuit

