

TLP631, 632

GaAs IRED & PHOTO-TRANSISTOR

PROGRAMMABLE CONTROLLERS

AC/DC-INPUT MODULE

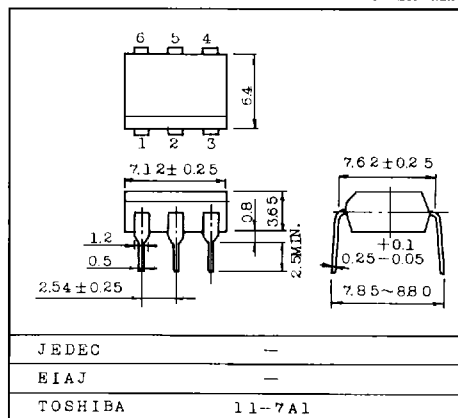
SOLID STATE RELAY

The TOSHIBA TLP631 and TLP632 consist of a photo-transistor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

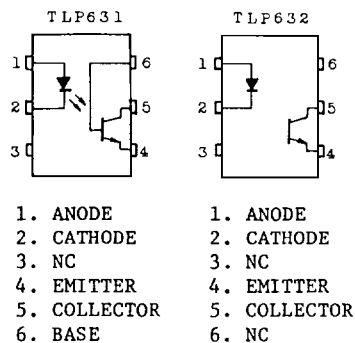
TLP632 is no-base internal connection for high-EMI environments.

- collector-Emitter Voltage : 55V Min.
- Current Transfer Ratio : 50% Min.
Rank GB : 100% Min.
- Isolation Voltage : 5000Vrms Min,
- UL Recognized : File No. E67349

Unit in mm



PIN CONFIGURATIONS (TOP VIEW)



MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I_F	60	mA
	Forward Current Derating (Ta≥39°C)	$\Delta I_F/^\circ\text{C}$	-0.7	mA/°C
	Peak Forward Current (100μs pulse, 100pps)	I_{FP}	1	A
	Reverse Voltage	V_R	5	V
	Junction Temperature	T_j	125	°C
DETECTOR	Collection-Emitter Voltage	V_{CED}	55	V
	Collector-Base Voltage (TLP631)	V_{CBO}	80	V
	Emitter-Collector Voltage	V_{ECO}	7	V
	Emitter-Base Voltage (TLP631)	V_{EBO}	7	V
	Collector Current	I_C	50	mA
	Power Dissipation	P_C	150	mW
	Power Dissipation Derating (Ta≥25°C)	$\Delta P_C/^\circ\text{C}$	-1.5	mW/°C
	Junction Temperature	T_j	125	°C
Storage Temperature Range		T_{stg}	-55~125	°C
Operating Temperature Range		T_{opr}	-55~100	°C
Lead Soldering Temperature (10 sec.)		T_{sold}	260	°C
Total Package Power Dissipation		P_T	250	mW
Total Package Power Dissipation Derating (Ta≥25°C)		$\Delta P_T/^\circ\text{C}$	-2.5	mW/°C
Isolation Voltage (AC, 1 min, RH≤60%)		BV_S	5000	V_{rms}

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta=25°C)

	CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V_F	$I_F=10\text{mA}$	1.0	1.15	1.3	V
	Reverse Current	I_R	$V_R=5\text{V}$	-	-	10	μA
	Capacitance	C_T	$V=0, f=1\text{MHz}$	-	30	-	pF
DETECTOR	Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=0.5\text{mA}$	55	-	-	V
	Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E=0.1\text{mA}$	7	-	-	V
	Collector-Base Breakdown Voltage (TLP631)	$V_{(BR)CBO}$	$I_C=0.1\text{mA}$	80	-	-	V
	Emitter-Base Breakdown Voltage (TLP631)	$V_{(BR)EBO}$	$I_E=0.1\text{mA}$	7	-	-	V
	Collector Dark Current	I_{CEO}	$V_{CE}=24\text{V}$	-	10	100	nA
			$V_{CE}=24\text{V}, T_a=85^\circ\text{C}$	-	2	50	μA
	Capacitance (Collector to Emitter)	C_{CE}	$V=0, f=1\text{MHz}$	-	10	-	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I_C/I_F	$I_F=5\text{mA}, V_{CE}=5\text{V}$ Rank GB	50	-	600	%
			100	-	600	
Saturated CTR	I_C/I_F (sat)	$I_F=1\text{mA}, V_{CE}=0.4\text{V}$ Rank GB	-	60	-	%
			-	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=2.4\text{mA}, I_F=8\text{mA}$	-	-	0.4	V

ISOLATION CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance (Input to Output)	CS	V _S =0, f=1MHz	-	0.8	-	pF
Isolation Resistance	R _S	V _S =500V, R.H≤60%	5×10 ¹⁰	10 ¹⁴	-	Ω
Isolation Voltage	BV _S	AC, 1 minute	5000	-	-	V _{rms}

SWITCHING CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	t _r	V _{CC} =10V I _C =2mA R _L =100Ω	-	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 =1.9kΩ (Fig.1) R _{BE} =OPEN V _{CC} =5V, I _F =16mA	-	2	-	μs
Storage Time	t _S		-	15	-	
Turn-off Time	t _{OFF}		-	25	-	
Turn-on Time	t _{ON}	R _L =1.9kΩ (Fig.1) R _{BE} =220kΩ (TLP631) V _{CC} =5V, I _F =16mA	-	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	Topr	-25	-	85	°C

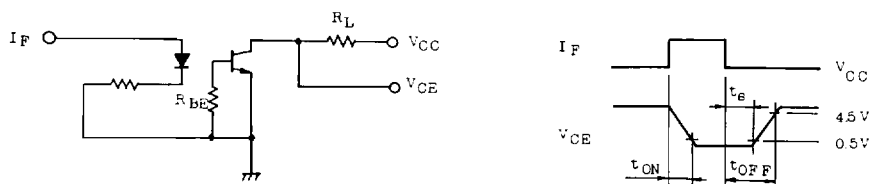


Fig. 1 Switching Time Test Circuit

