

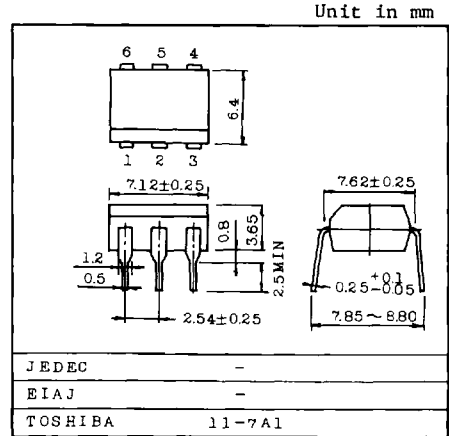
TLP531, 532

PROGRAMMABLE CONTROLLERS
 AC/DC-INPUT MODULE
 SOLID STATE RELAY

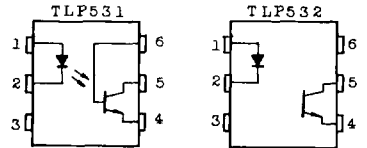
The TOSHIBA TLP531 and TLP532 consist of a photo-transistor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

TLP532 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 : 2500Vrms Min.
- UL Recognized : File No. E67349



PIN CONFIGURATION (TOP VIEW)



- | | |
|--------------|--------------|
| 1. ANODE | 1. ANODE |
| 2. CATHODE | 2. CATHODE |
| 3. NC | 3. NC |
| 4. EMITTER | 4. EMITTER |
| 5. COLLECTOR | 5. COLLECTOR |
| 6. BASE | 6. NC |



TLP531, 532

MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I _F	70	mA
	Forward Current Derating (Ta ≥ 50°C)	ΔI _F /°C	0.93	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	Collector-Emitter Voltage	V _{CEO}	55	V
	Collector-Base Voltage (TLP531)	V _{CB0}	80	V
	Emitter-Collector Voltage	V _{ECO}	7	V
	Emitter-Base Voltage (TLP531)	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}	-55~125	°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)		ΔP _T /°C	-2.5	mW/°C
Isolation Voltage (AC, 1 min, RH ≤ 60%)		BV _S	2500	V _{rms}

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	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 (TLP531)	V _{(BR)CBO}	I _C =0.1mA	80	-	-	V
	Emitter-Base Breakdown Voltage (TLP531)	V _{(BR)EBO}	I _E =0.1mA	7	-	-	V
	Collector Dark Current	I _{CEO}	V _{CE} =24V	-	10	100	nA
			V _{CE} =24V, T _A =85°C	-	2	50	μA
Capacitance (Collector to Emitter)	C _{CE}	V=0, f=1MHz	-	10	-	pF	

CHARACTERISTICS	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I _C /I _F	I _F =5mA, V _{CE} =5V	50	200	600	%
		Rank Y	50	-	150	
		Rank YG	50	-	300	
		Rank GR	100	-	300	
		Rank GB	100	-	600	
		Rank BL	200	-	600	
Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _C =2.4mA, I _F =8mA	-	-	0.4	V

ISOLATION CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance(Input to Output)	CS	VS=0, f=1MHz	-	0.8	-	PF
Isolation Resistance	RS	VS=500V, R.H.≤60%	5×10 ¹⁰	10 ¹⁴	-	Ω
Isolation Voltage	BVS	AC, 1 minute	2500	-	-	Vrms

SWITCHING CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	tr	VCC=10V IC=2mA RL=100Ω	-	2	-	μs
Fall Time	tf		-	3	-	
Turn-on Time	ton		-	3	-	
Turn-off Time	toff		-	3	-	
Turn-on Time	tON	RL=1.9kΩ (Fig.1)	-	2	-	μs
Storage Time	tS	RBE=OPEN	-	15	-	
Turn-off Time	tOFF	VCC=5V, IF=16mA	-	25	-	
Turn-on Time	tON	RL=1.9kΩ (Fig.1)	-	2	-	μs
Storage Time	tS	RBE=220kΩ (TLP531)	-	12	-	
Turn-off Time	tOFF	VCC=5V, IF=16mA	-	20	-	

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	VCC	-	5	24	V
Forward Current	IF	-	16	25	mA
Collector Current	IC	-	1	10	mA
Operating Temperature	Topr	-25	-	85	°C

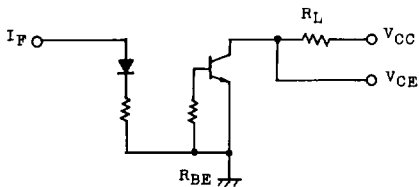
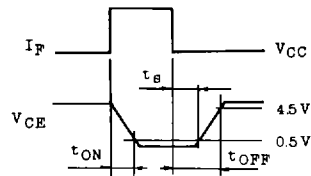
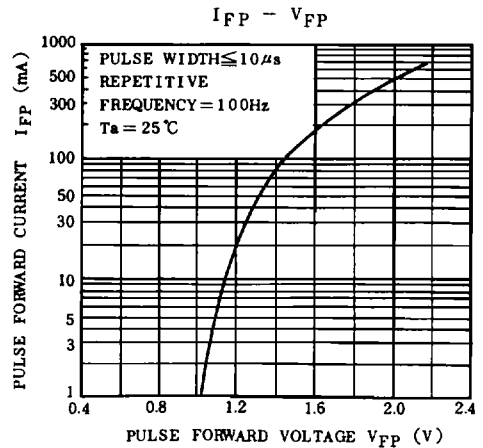
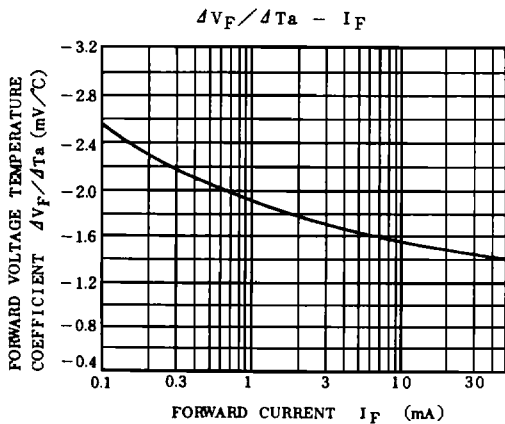
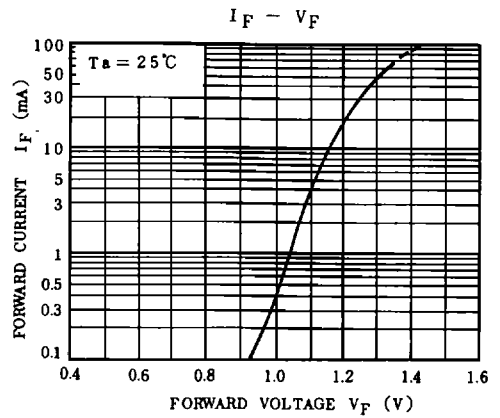
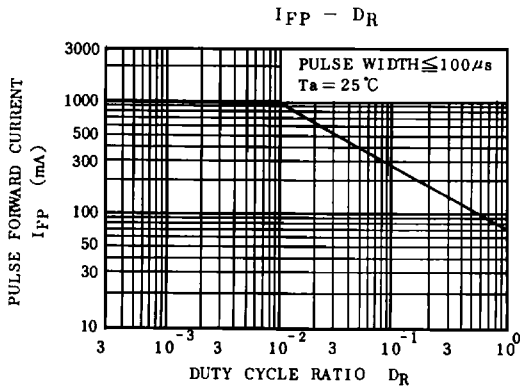
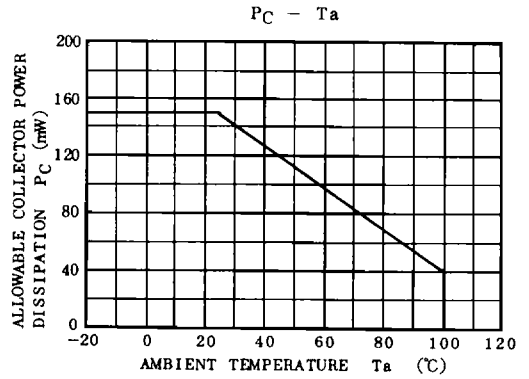
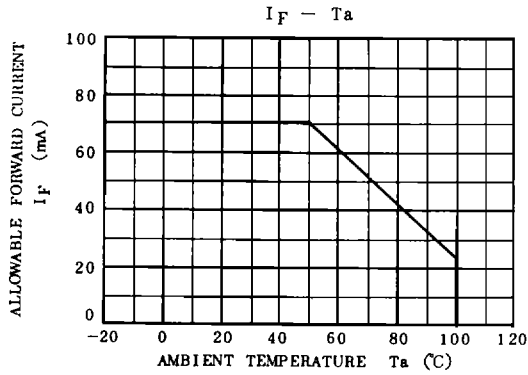
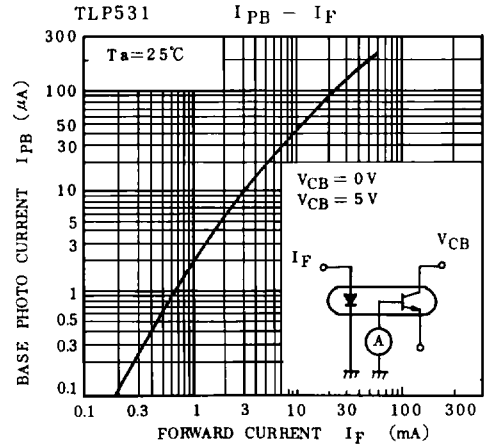
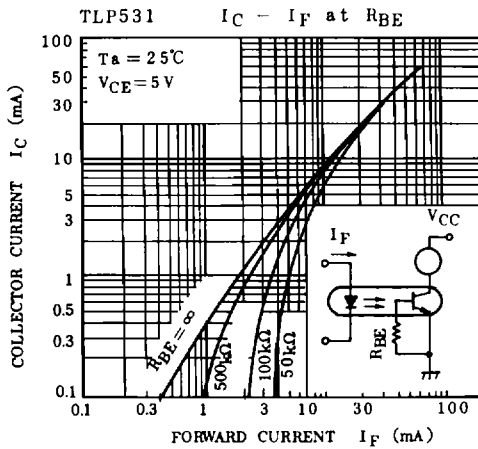
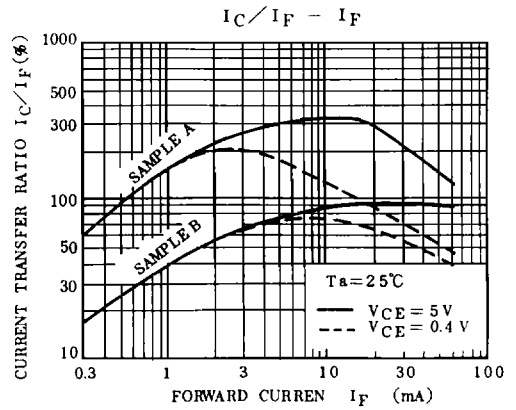
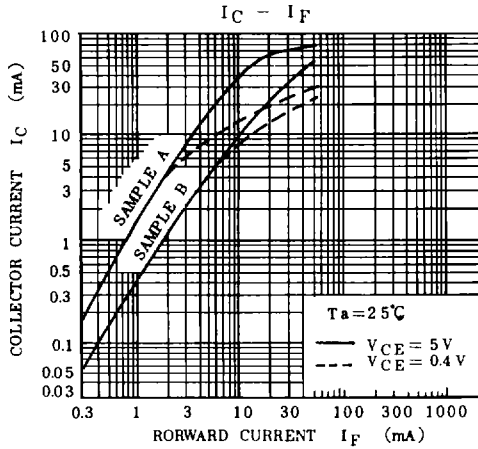
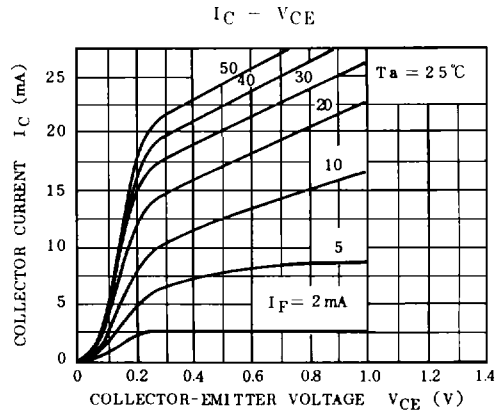
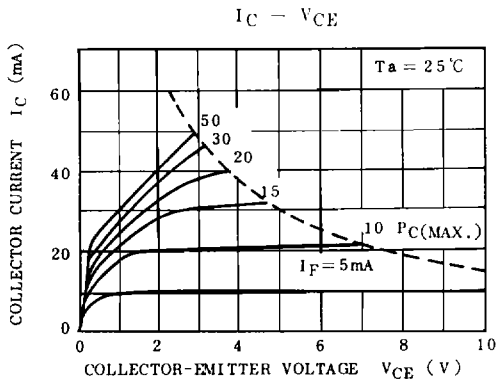
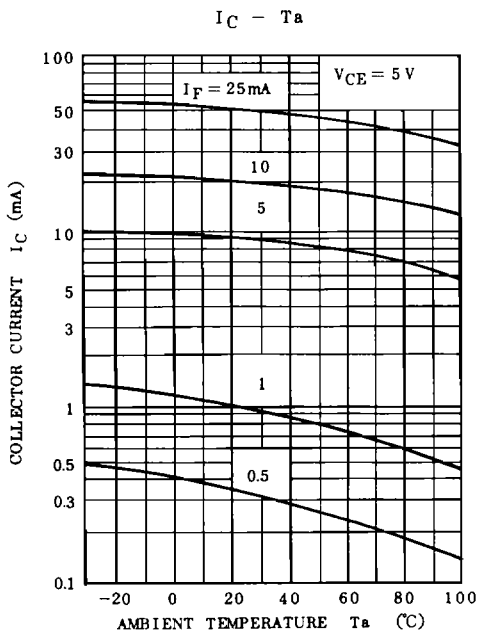
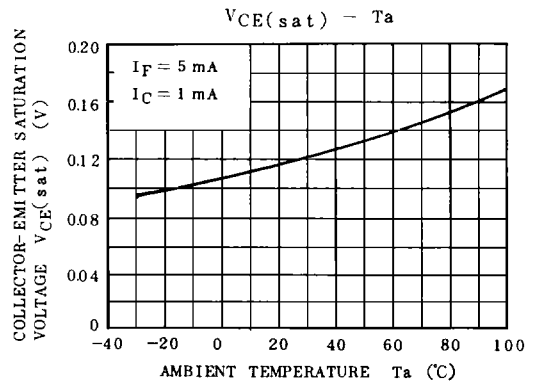
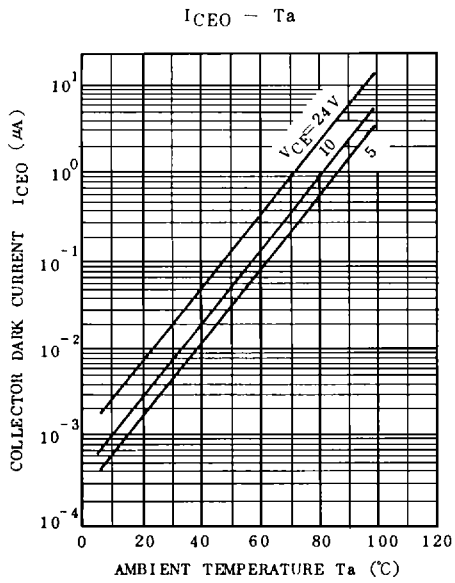


Fig. 1 Switching Time Test Circuit

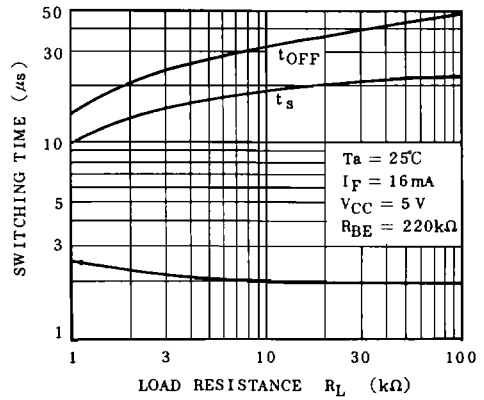




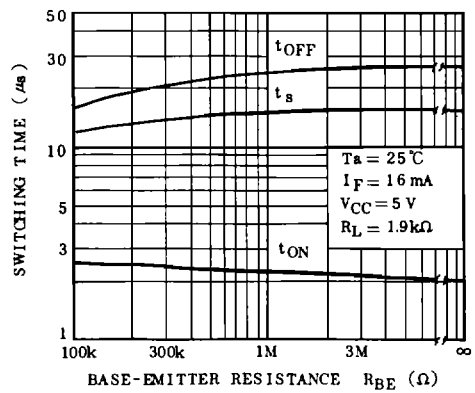




TLP531 SWITCHING TIME - R_L



TLP531 $R_{BE} -$ SWITCHING TIME



TLP531,532

