

TENTATIVE DATA

OFFICE MACHINE.
HOUSEHOLD USE EQUIPMENT.
PROGRAMMABLE CONTROLLERS.
AC/DC-INPUT MODULE.
TELECOMMUNICATION.

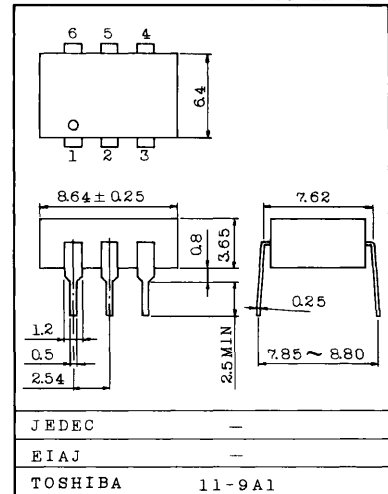
The TOSHIBA TLP639 consists of two gallium arsenide infrared emitting diode connected inverse parallel, optically coupled to a photo-transistor in a six lead plastic DIP package.

- . Collector-Emitter Voltage : 55V Min.
- . Current Transfer Ratio : 50% Min.
Rank GB : 100% Min.
- . Isolation Voltage : 5000V_{rms} Min.
- . Guaranteed Requirements of IEC380/VDE0806
- . Climatic Test Class : 55/150/21
- . Isolation Creepage Path : 8.0mm Min.
- . Isolation Clearance : 7.3mm Min.
- . Isolation Operating Voltage
: 500V_{ac} or 600V_{dc} for Isolation Group C.*¹
- . Creeping Current Resistance : Group I.*²

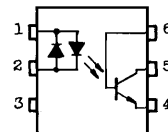
*1 : According to VDE0110, table 4

*2 : According to VED0110, table 3

Unit in mm



PIN COFIGURATIONS (TOP VIEW)



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

MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I _F (RMS)	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
	Junction Temperature	T _j	125	°C
DETECTOR	Collector-Emitter Voltage	V _{CEO}	55	V
	Collector-Base Voltage	V _{CB0}	80	V
	Emitter-Collector Voltage	V _{ECO}	7	V
	Emitter-Base Voltage	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 _{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%)		BVS	5000	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
	Forward Current	I _F	V _F =±0.7V	-	2.5	10	μA
	Capacitance	C _T	V=0, f=1MHz	-	60	-	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	V(BR)CBO	I _C =0.1mA	80	-	-	V
	Emitter-Base Breakdown Voltage	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	I _{CER}	V _{CE} =24V, Ta=85°C R _{BE} =1MΩ	-	0.5	10	μA
	Collector Dark Current	I _{CBO}	V _{CB} =10V	-	0.1	-	nA
	DC Forward Current Gain	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	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 Rank GB	-	0.2	-	
			-	-	0.4	
Off-State Collector Current	I _C (off)	V _F =±0.7V, V _{CE} =24V	-	1	10	μA
CRT Symmetry	I _C (ratio)	I _C (I _F =-5mA)/I _C (I _F =5mA)	0.5	-	2	-

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	RS	V _S =500V	5×10 ¹⁰	10 ¹⁴	-	Ω
Isolation Voltage	BVS	AC, 1 minute	5000	-	-	Vrms
		AC, 1 second	-	10000	-	
		DC, 1 minute	-	10000	-	V _{dc}

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	10	
Turn-off Time	t _{off}		-	3	10	
Turn-on Time	t _{ON}	R _L =1.9kΩ (Fig.1)	-	2	-	μs
Storage Time	t _S	R _{BE} =OPEN	-	15	-	
Turn-off Time	t _{OFF}	V _{CC} =5V, I _F =±16mA	-	25	-	
Turn-on Time	t _{ON}	R _L =1.9kΩ (Fig.1)	-	2	-	μs
Storage Time	t _S	R _{BE} =220kΩ	-	12	-	
Turn-off Time	t _{OFF}	V _{CC} =5V, I _F =±16mA	-	20	-	

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{CC}	-	5	24	A
Forward Current	I _F (RMS)	-	16	25	mA
Collector Current	I _C	-	1	10	mA
Operating Temperature	T _{opr}	-25	-	85	°C

Fig. 1 SWITCHING TIME TEST CIRCUIT

