Unit in mm

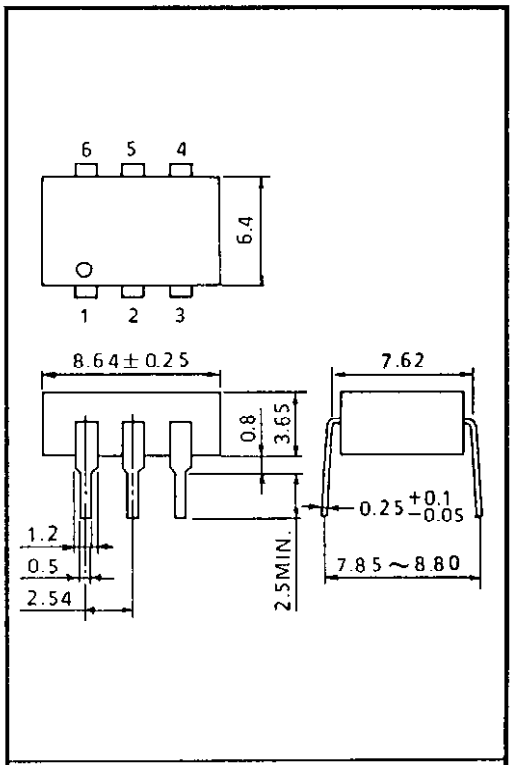
Telecommunication

Data Acquisition

Measurement Instrumentation

The Toshiba TLP595B consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a six lead plastic DIP package. The TLP595B is a bi-directional switch which can replace mechanical relays in many applications.

- Peak Off-State Voltage : 100V (Min.)
- On-State Current : 200mA (Max.) (A Connection)
- On-State Resistance : 4Ω (Max.) (A Connection)
- Isolation Voltage : 2500Vrms (Min.)
- UL Recognized : UL1577, File No. E67349
- Trigger LED Current (Ta = 25°C)

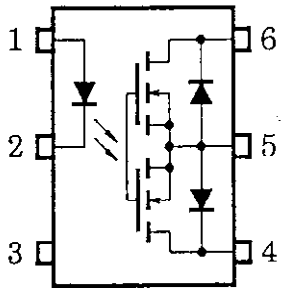


JEDEC	—
EIAJ	—
TOSHIBA	11-9A1

Weight : 0.49g

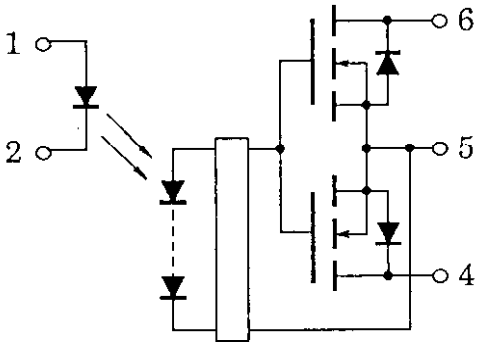
Supplementary Information	Page (s)
Lead Form Options	31-32
Tape and Reel	39-40

Pin Configuration (Top View)



1. : ANODE
2. : CATHODE
3. : NC
4. : DRAIN D1
5. : SOURCE
6. : DRAIN D2

Schematic



CLASSIFICATION (Note 1)	TRIGGER LED CURRENT (mA) @I_{ON} = 200mA		MARKING OF CLASSIFICATION
	MIN.	MAX.	
(IFT2)	–	2	T2
Standard	–	5	T2, Blank

Note 1: Application type name for certification test, please use standard product type name, i.e., TLP595B (IFT2): TLP595B

Maximum Ratings (Ta = 25°C)

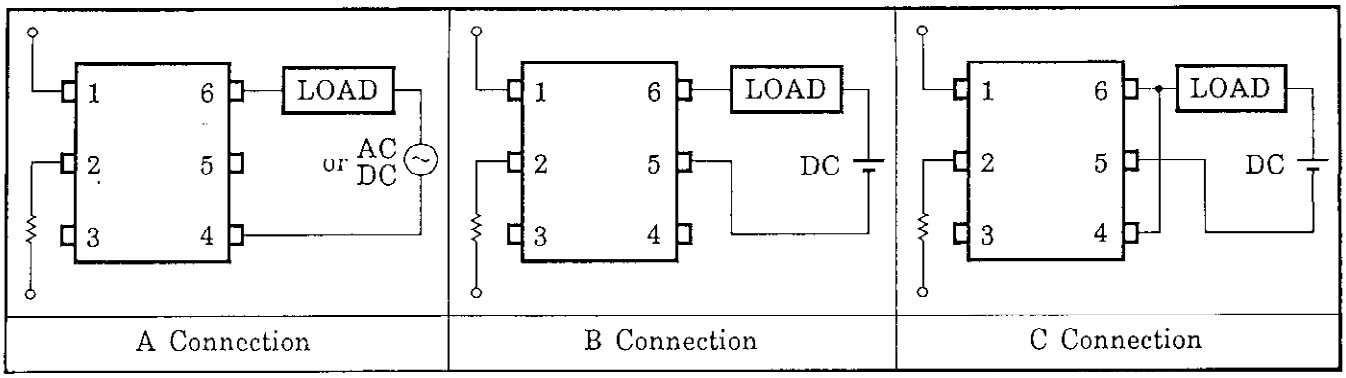
CHARACTERISTIC			SYMBOL	RATING	UNIT
LED	Forward Current		I_F	30	mA
	Forward Current Derating (Ta ≥ 25°C)		ΔI_F/°C	-0.3	mA/°C
	Pulse Forward Current (100μs pulse, 100pps)		I_{FP}	1	A
	Reverse Voltage		V_R	5	V
	Junction Temperature		T_j	125	°C
DETECTOR	Off-State Output Terminal Voltage		V_{OFF}	100	V
	On-State RMS Current	A Connection	I_{ON}	200	mA
		B Connection		300	
		C Connection		400	
	On-State Current Derating (Ta ≥ 25°C)	A Connection	ΔI_{ON}/°C	-2	mA/°C
		B Connection		-3	
		C Connection		-4	
	Junction Temperature		t_j	125	°C
Storage Temperature Range			T_{stg}	-55~100	°C
Operating Temperature Range			T_{opr}	-20~85	°C
Lead Soldering Temperature (10s)			T_{sol}	260	°C
Isolation Voltage (AC, 1 min., R.H. ≤ 60%)		(Note 2)	BV_S	2500	V_{rms}

Note 1:Device considered a two terminal device: pins 1, 2 and 3 shorted together, and pins 4, 5 and 8 shorted together.

Recommended Operating Conditions

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MX.	UNIT
Supply Voltage	V_D	–	–	80	V
Forward Current	I_F	10	15	20	mA
On-State Current	I_{ON}	–	–	200	mA
Operating Temperature	T_{opr}	-20	–	80	°C

Circuit Connections



Individual Electrical Characteristics (Ta = -25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.*	MX.	UNIT
LED	Forward Voltage	V_F	I_F = 10mA	1.2	1.4	1.7	V
	Reverse Current	I_R	V_R = 3V	–	–	10	μA
	Capacitance	C_T	V = 0, f = 1MHz	–	15	–	pF
DETECTOR	Off-State Current	I_{OFF}	V_{OFF} = 100V	–	–	1	μA
	Capacitance	C_{OFF}	V = 0, f = 1MHz	–	–	–	pF

Coupled Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MX.	UNIT
Trigger LED Current		I_{FT}	I_{ON} = 200mA	–	1	5	mA
On-State Resistance	A Connection	R_{ON}	I_{ON} = 200mA, I_F = 10mA	–	3.0	4	Ω
	B Connection		I_{ON} = 300mA, I_F = 10mA	–	1.5	2	
	C Connection		I_{ON} = 400mA, I_F = 10mA	–	0.75	1	

Isolation Characteristics (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MX.	UNIT
Capacitance Input to Output	C_S	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	2500	–	–	V_{rms}
		AC, 1 second in oil	–	5000	–	
		DC, 1 minute in oil	–	5000	–	V_{dc}

Switching Characteristics (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MX.	UNIT
Turn-on Time	t_{on}	V_{DD} = 20mA, R_L = 200Ω I_F = 10mA (Note 3)	–	0.1	0.4	ms
Turn-off Time	t_{off}		–	0.2	0.4	

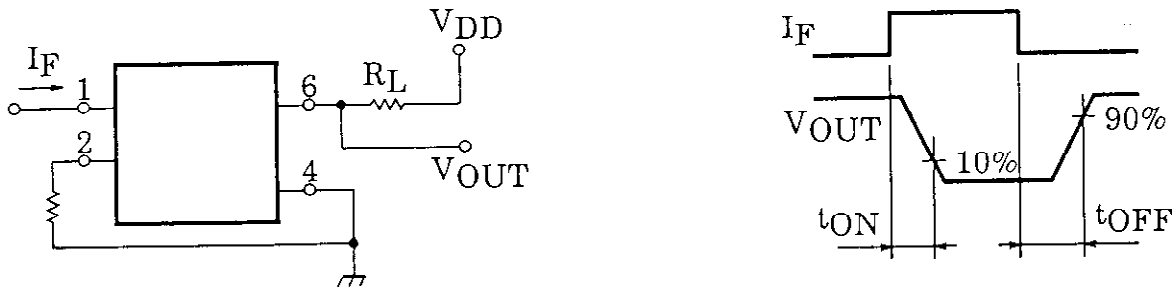
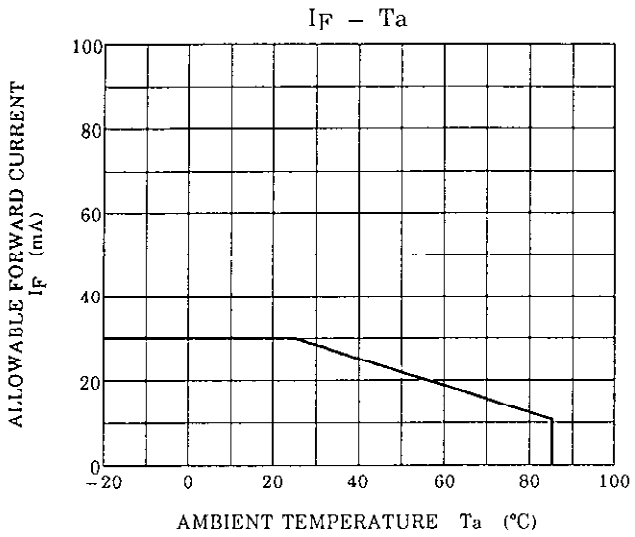
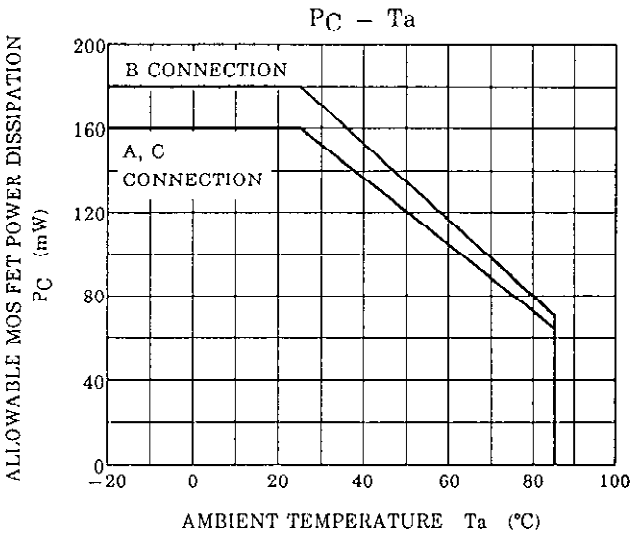
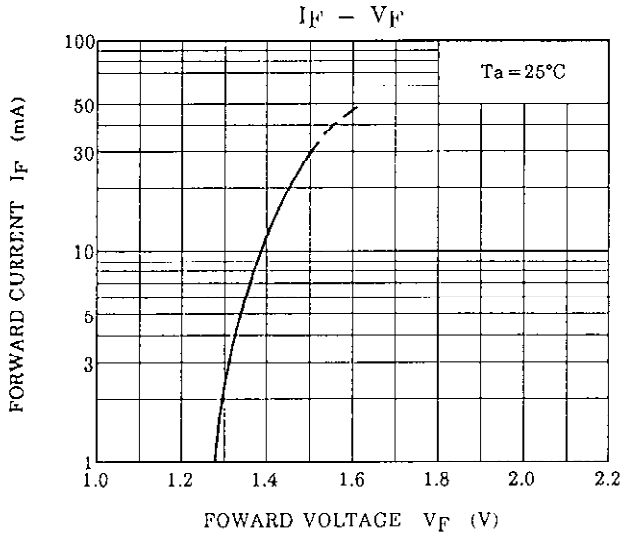
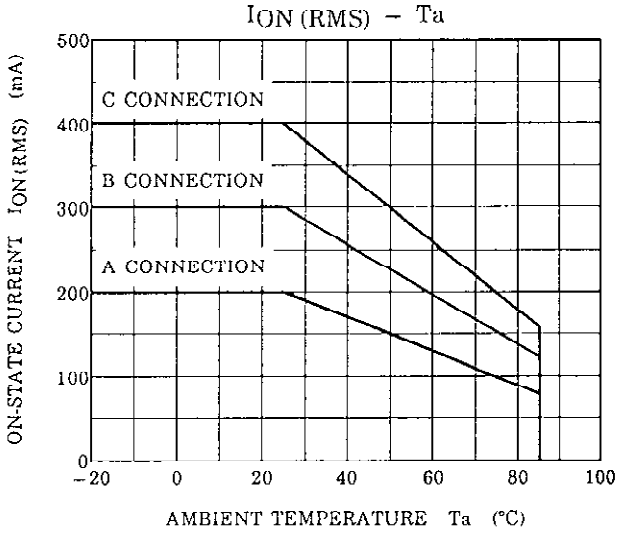


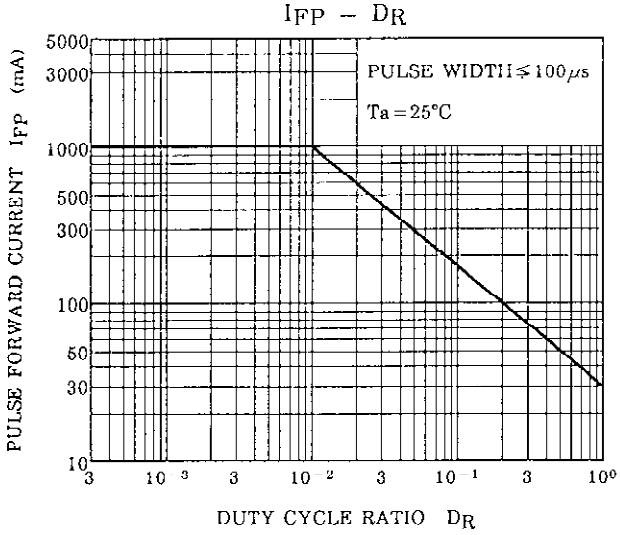
Figure 1. Switching Time Test Circuit

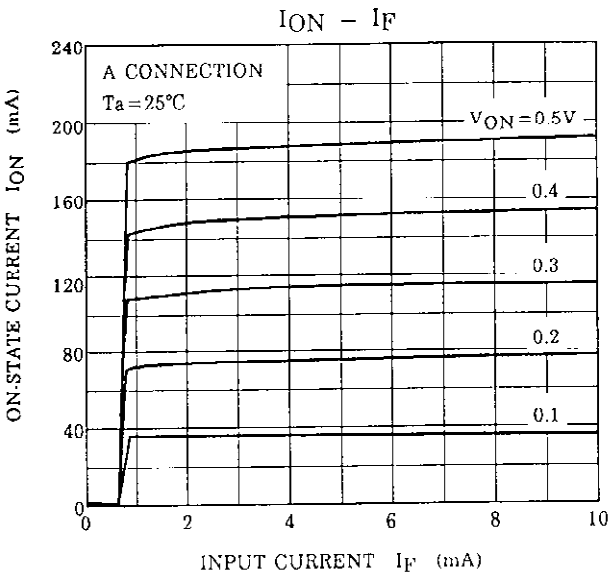

IF – Ta
ALLOWABLE FOEWARD CURRENT IF (mA)
100
80
60
40
20
0
−20
0
20
40
60
80
100
AMBIENT TEMPERATURE Ta (°C)

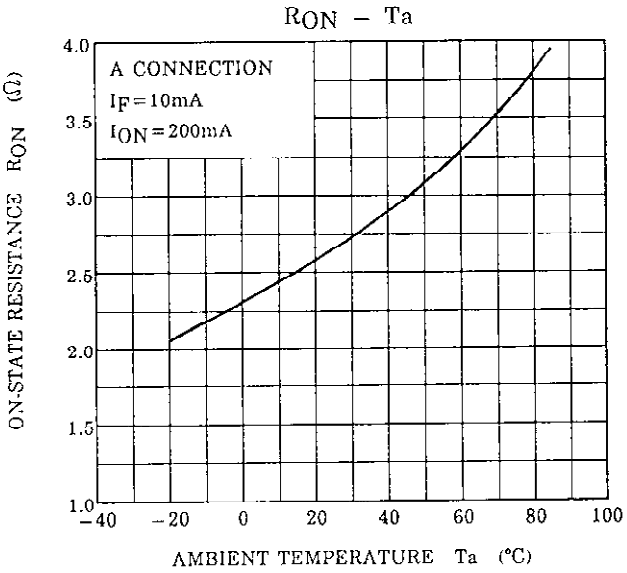

PC – Ta
ALLOWABLE MOS FET POWER DISSIPATION PC (mW)
B CONNECTION
A, C CONNECTION
200
160
120
80
40
0
−20
0
20
40
60
80
100
AMBIENT TEMPERATURE Ta (°C)

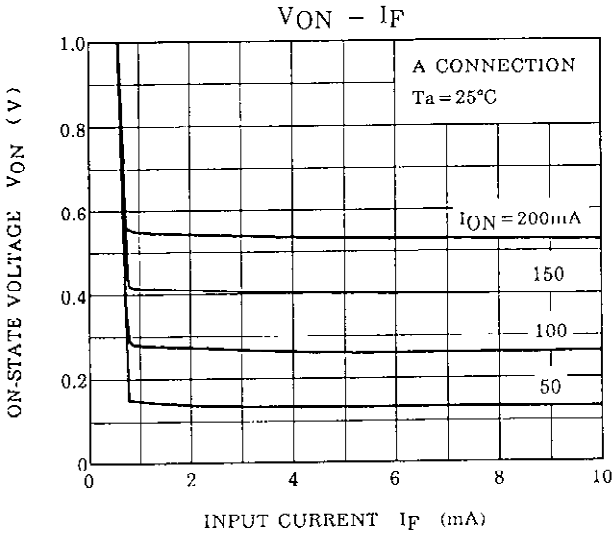

IF – VF
FORWARD CURRENT IF (mA)
Ta = 25°C
100
50
30
10
5
3
1
1.0
1.2
1.4
1.6
1.8
2.0
2.2
FOWARD VOLTAGE VF (V)

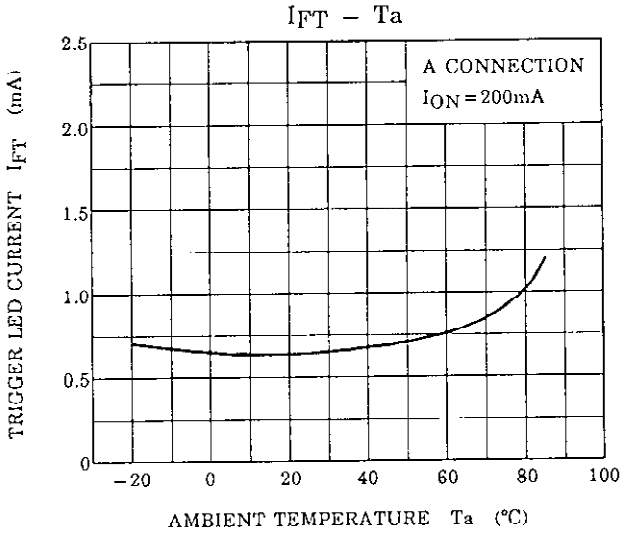

ION (RMS) – Ta
ON-STATE CURRENT ION(RMS) (mA)
C CONNECTION
B CONNECTION
A CONNECTION
500
400
300
200
100
0
−20
0
20
40
60
80
100
AMBIENT TEMPERATURE Ta (°C)

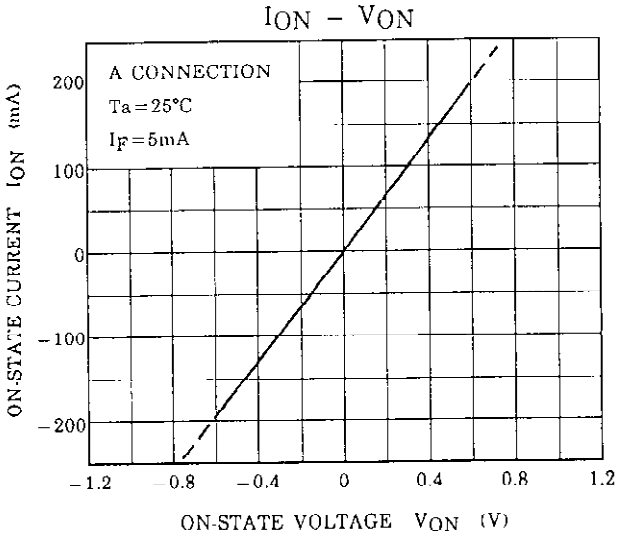

IFP – DR
PULSE FORWARD CURRENT IFP (mA)
PULSE WIDTH ≦ 100μs
Ta = 25°C
5000
3000
1000
500
300
100
50
30
10
3
10⁻³
3
10⁻²
3
10⁻¹
3
10⁰
DUTY CYCLE RATIO DR

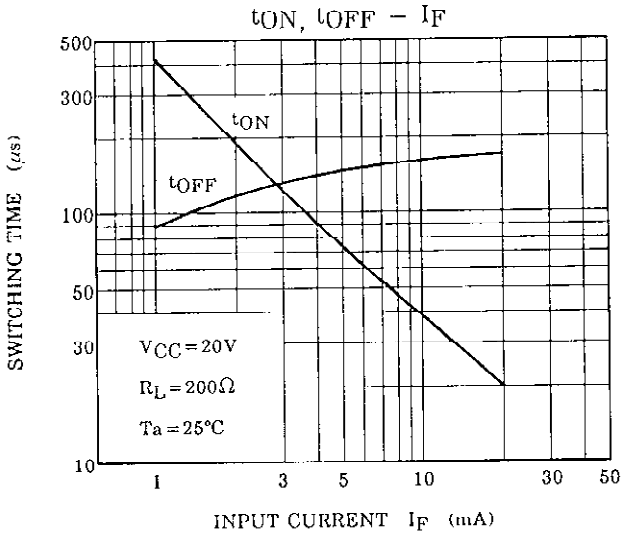

ION – IF
A CONNECTION
Ta = 25°C
VON = 0.5V
0.4
0.3
0.2
0.1
ON-STATE CURRENT ION (mA)
INPUT CURRENT IF (mA)


RON – Ta
A CONNECTION
IF = 10mA
ION = 200mA
ON-STATE RESISTANCE RON (Ω)
AMBIENT TEMPERATURE Ta (°C)


VON – IF
A CONNECTION
Ta = 25°C
ION = 200mA
150
100
50
ON-STATE VOLTAGE VON (V)
INPUT CURRENT IF (mA)


IFT – Ta
A CONNECTION
ION = 200mA
TRIGGER LED CURRENT IFT (mA)
AMBIENT TEMPERATURE Ta (°C)


ION – VON
A CONNECTION
Ta = 25°C
IF = 5mA
ON-STATE CURRENT ION (mA)
ON-STATE VOLTAGE VON (V)


tON, tOFF – IF
tON
tOFF
VCC = 20V
RL = 200Ω
Ta = 25°C
SWITCHING TIME (μs)
INPUT CURRENT IF (mA)