

9097250 TOSHIBA (DISCRETE/OPTO)

99D 17452 D

T-41-87

# TLP543J, TLP545J

## GaAs IRED & PHOTO-THYRISTOR

The TOSHIBA TLP543J consists of a photothyristor optically coupled to a gallium arsenide infrared emitting diode in a seven lead plastic DIP package.

The TOSHIBA TLP545J consists of a photothyristor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

- Peak Off-State Voltage : 600V Min.
- Trigger LED Current : 10mA Max.
- On-State Current : 150mA Max.
- Isolation Voltage : 2500Vrms Min.
- UL Recognized : File No. E67349

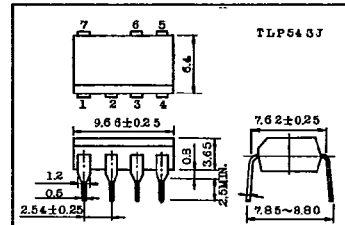
### MAXIMUM RATINGS (Ta = 25 °C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	$I_F$	60	mA
	Forward Current Derating (Ta≥39°C)	$\Delta I_F/^\circ C$	-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)	$\Delta P_D/^\circ C$	-1.0	mW/°C
	Reverse Voltage	$V_R$	5	V
	Junction Temperature	$T_j$	125	°C
DETECTOR	Peak Forward Voltage (R <sub>GK</sub> =27KΩ)	$V_{DRM}$	600	V
	Peak Reverse Voltage (R <sub>GK</sub> =27KΩ)	$V_{RRM}$	600	V
	On-State Current	$I_T(RMS)$	150	mA
	On-State Current Derating (Ta≥25°C)	$\Delta I_T/^\circ C$	-2.0	mA/°C
	Peak On-State Current (100µs pulse, 120pps)	$I_{TP}$	3	A
	Peak One Cycle Surge Current	$I_{TSM}$	2	A
	Peak Reverse Gate Voltage	$V_{GH}$	5	V
	Power Dissipation	$P_D$	150	mW
	Power Dissipation Derating (Ta≥25°C)	$\Delta P_D/^\circ C$	-2.0	mW/°C
	Junction Temperature	$T_j$	100	°C
	Storage Temperature Range	$T_{stg}$	-55~150	°C
	Operating Temperature Range	$T_{opr}$	-55~100	°C
	Lead Soldering Temperature (10sec.)	$T_{sold}$	260	°C
Total Package Power Dissipation	$P_T$	250	mW	
Total Package Power Dissipation Derating (Ta≥25°C)	$\Delta P_T/^\circ C$	-3.3	mW/°C	
Isolation Voltage (AC, 1 min, RH560%)	$BV_S$	2500	V <sub>rms</sub>	

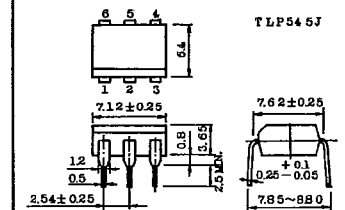
### RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	$V_{AC}$	-	-	240	V <sub>ac</sub>
Forward Current	$I_F$	15	20	25	mA
Operating Temperature	$T_{opr}$	-25	-	85	°C
Gate to Cathode Resistance	$R_{GK}$	-	10	27	kΩ
Gate to Cathode Capacity	$C_{GK}$	-	0.01	0.1	µF

Unit in mm

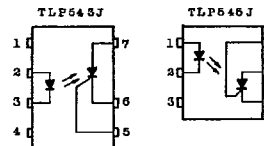


JEDRC	-
BIAJ	-
TOSHIBA	11-10C1



JEDRC	-
BIAJ	-
TOSHIBA	11-7A1

### PIN CONFIGURATIONS (TOP VIEW)



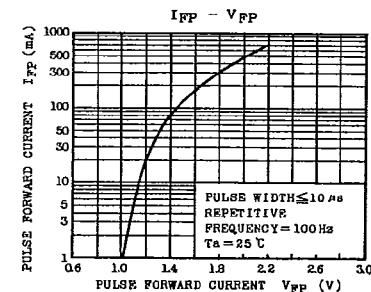
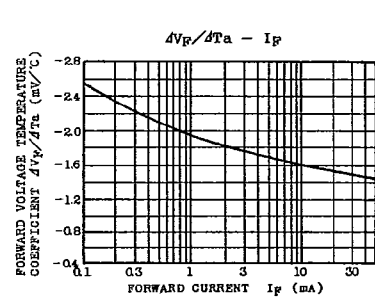
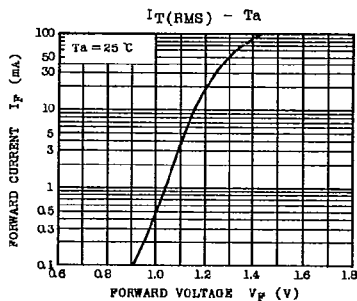
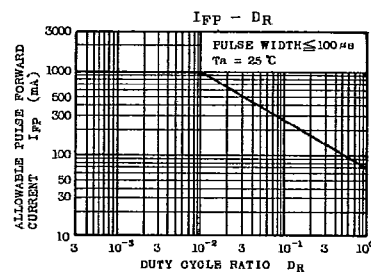
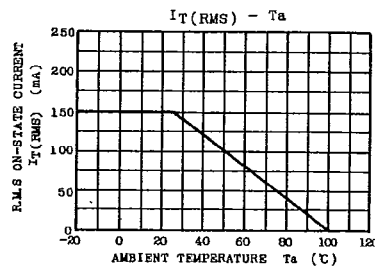
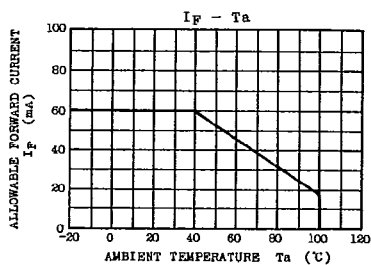
- 1: NC
- 2: ANODE
- 3: CATHODE
- 4: NC
- 5: GATE
- 6: CATHODE
- 7: ANODE

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
LED	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =10mA	1.0	1.15	1.3	V	
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> =5V	-	-	10	μA	
	Capacitance	C <sub>T</sub>	V=0, f=1MHz	-	30	-	pF	
DETECTOR	Off-State Current	I <sub>DRM</sub>	V <sub>AK</sub> =600V R <sub>GK</sub> =27kΩ	Ta=25°C	-	10	5000	nA
			Ta=85°C	-	1	150	μA	
	Reverse Current	I <sub>RRM</sub>	V <sub>KA</sub> =600V R <sub>GK</sub> =27kΩ	Ta=25°C	-	10	5000	nA
				Ta=85°C	-	1	150	μA
	On-State Voltage	V <sub>TM</sub>	I <sub>TM</sub> =100mA	-	0.9	1.3	V	
	Holding Current	I <sub>H</sub>	R <sub>GK</sub> =27kΩ	-	0.2	-	mA	
	Off-State dv/dt	dv/dt	V <sub>AK</sub> =420V, R <sub>GK</sub> =27kΩ	-	10	-	V/μs	
Capacitance	C <sub>j</sub>	V=0, f=1MHz Anode to Gate Gate to Cathode	-	20	-	-	pF	
			-	350	-	-	pF	

COUPLED CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	I <sub>FT</sub>	V <sub>AK</sub> =6V, R <sub>GK</sub> =27kΩ	-	5	10	mA
Turn-on Time	t <sub>on</sub>	I <sub>F</sub> =30mA, V <sub>AA</sub> =50V R <sub>GK</sub> =27kΩ	-	10	-	μs
Coupled dv/dt	dv/dt	V <sub>S</sub> =500V, R <sub>GK</sub> =27kΩ	500	-	-	V/μs
Capacitance Input to Output	C <sub>S</sub>	V <sub>S</sub> =0, f=1MHz	-	0.8	-	pF
Isolation Resistance	R <sub>S</sub>	V <sub>S</sub> =500V	5x10 <sup>10</sup>	10 <sup>14</sup>	-	Ω
Isolation Voltage	V <sub>S</sub>	AC, 1 minute	2500	-	-	V <sub>rms</sub>
		AC, 1 second	-	5000	-	V <sub>rms</sub>
		DC, 1 minute	-	5000	-	V <sub>dc</sub>



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