

TOSHIBA SOLID STATE GTR DRIVER MODULE

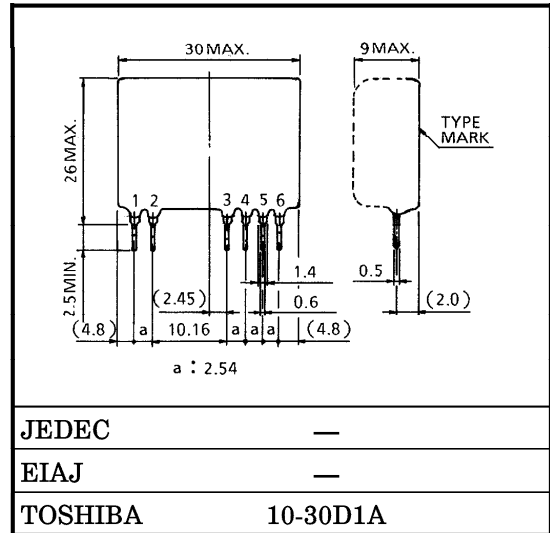
# TF1204

GTR DRIVER

Unit in mm

TOSHIBA TF1204 is the GTR driver designed for use with TOSHIBA Giant Transistor Module and it includes the optical isolator and GTR driver circuit. Using this driver, you can design high reliability and compact system.

- 2000V<sub>RMS</sub> Optical Isolation
- Logic Compatible Input
- High Speed Switching Response  
:  $t_{pLH} = 3\mu s$ ,  $t_{pHL} = 4\mu s$  (Typ.)
- Small Size and Light Weight

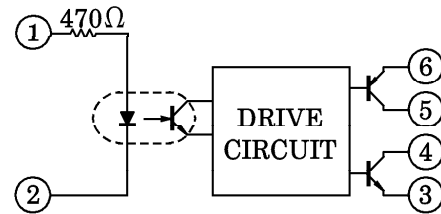


Weight : 8g

MAXIMUM RATINGS (Ta = 25°C)

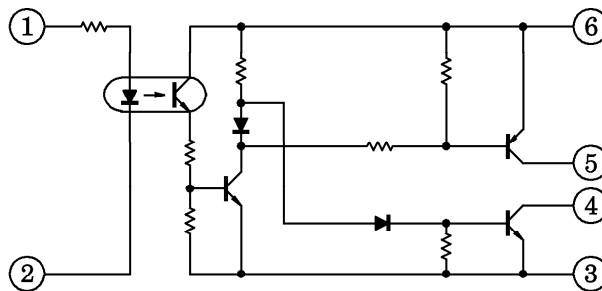
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	6	V
	V <sub>EE</sub>	-4	V
Input Voltage	V <sub>IN</sub>	5.5	V
Reverse Input Voltage	V <sub>RIN</sub>	5	V
High Level Output Current	I <sub>OH</sub>	-1	A
Low Level Peak Output Current	I <sub>OLP</sub>	3 (10μs)	A
Isolation (Input-Output)	BV <sub>S</sub> /AC	2000 (1min)	V
Operating Frequency	f	5	kHz
Operating Temperature	T <sub>opr</sub>	-20~70	°C
Storage Temperature	T <sub>stg</sub>	-20~100	°C

BLOCK DIAGRAM



1. INPUT (+)
2. INPUT (-)
3. OUTPUT 2 (-) [V<sub>EE</sub>]
4. OUTPUT 2 (+)
5. OUTPUT 1 (-)
6. OUTPUT 1 (+) [V<sub>CC</sub>]

CIRCUIT DIAGRAM



961001EBA2

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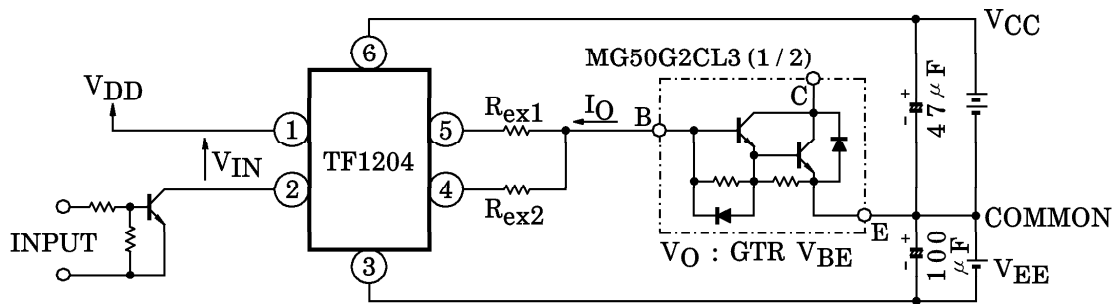
RECOMMENDED OPERATING CONDITIONS (Ta = -10~50°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sub>CC</sub>	—	4.5	5.0	5.5	V
	V <sub>EE</sub>	—	-2.5	-3.0	-3.5	V
High Level Input Voltage	V <sub>IH</sub>	—	—	5	—	V
External Resistor	R <sub>ex1</sub>	—	—	3.9	—	Ω
	R <sub>ex2</sub>	—	—	0.5	—	Ω
Operating Frequency	f	—	—	2	—	kHz

ELECTRICAL CHARACTERISTICS (Ta = 25°C, V<sub>CC</sub> = 5V, V<sub>EE</sub> = -3V, R<sub>ex1</sub> = 3Ω, R<sub>ex2</sub> = 0.22Ω)

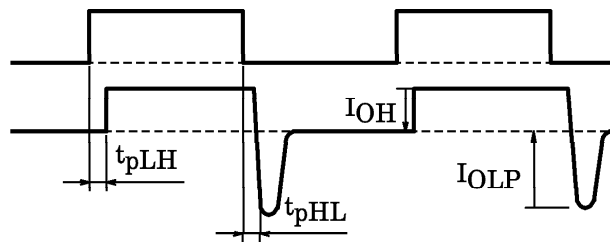
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Current	I <sub>IN</sub>	V <sub>IN</sub> = 5V	7	8	9	mA
High Level Input Voltage	V <sub>IH</sub>	I <sub>OH</sub> = -1A	—	2	4.5	V
Low Level Input Voltage	V <sub>IL</sub>	I <sub>OLP</sub> = 3A	1.0	2	—	V
High Level Output Current	I <sub>OH</sub>	V <sub>IN</sub> = 5V, V <sub>O</sub> = 1.5V	—	-1	—	A
Low Level Peak Output Current	I <sub>OLP</sub>	V <sub>IN</sub> = 0V	—	3	—	A
(Low→High) Propagation Delay Time	t <sub>pLH</sub>	V <sub>IN</sub> = 0→5V	—	3	10	μs
(High→Low) Propagation Delay Time	t <sub>pHL</sub>	V <sub>IN</sub> = 5→0V	—	4	10	μs
Power Dissipation	P <sub>D</sub>	f = 2kHz, D.f = 50%	—	440	—	mW

TEST CIRCUIT



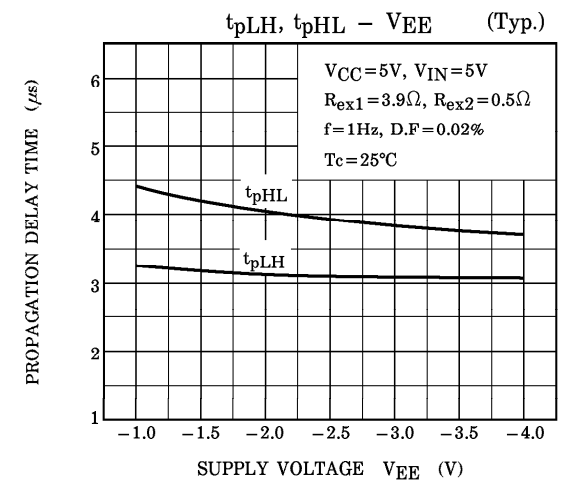
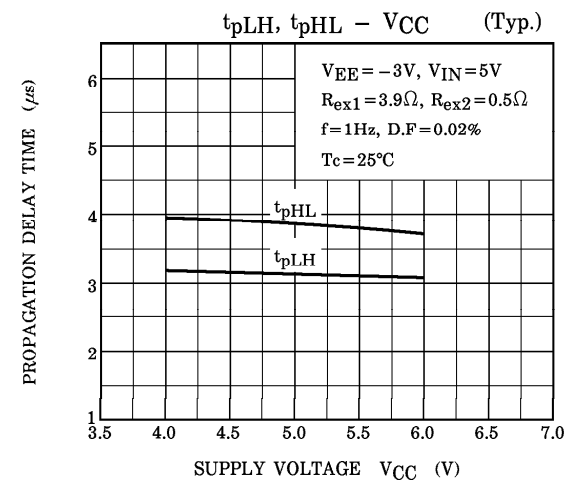
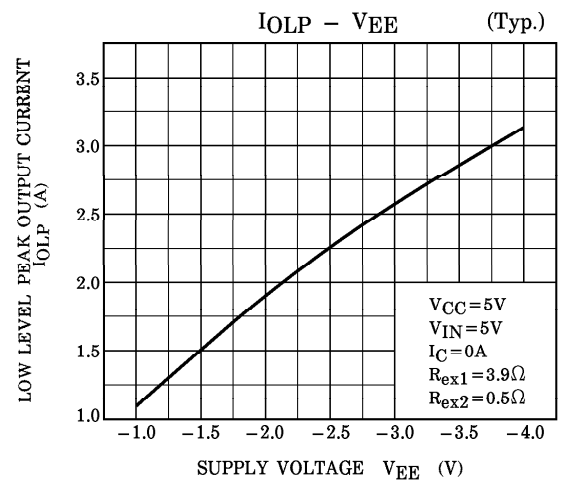
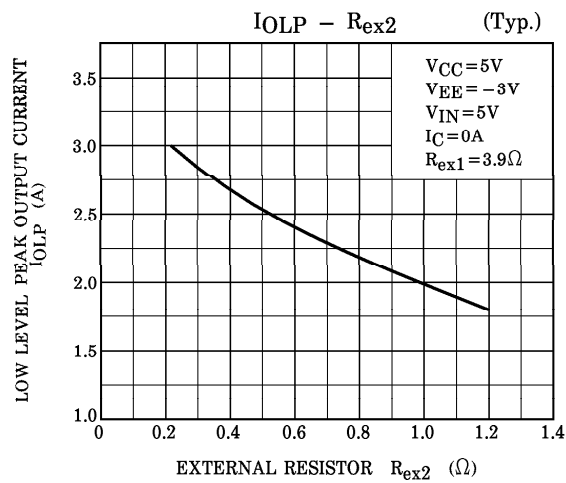
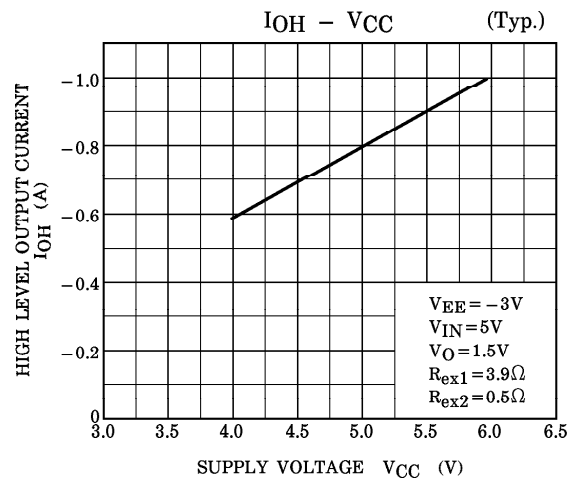
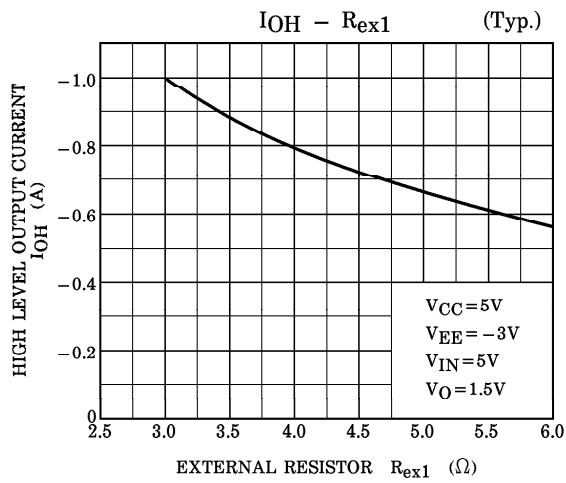
INPUT VOLTAGE  
(V<sub>IN</sub>)

GTR BASE CURRENT  
(-I<sub>O</sub>)

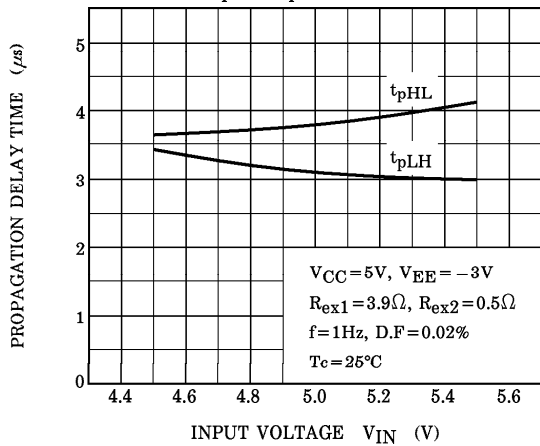


961001EBA2'

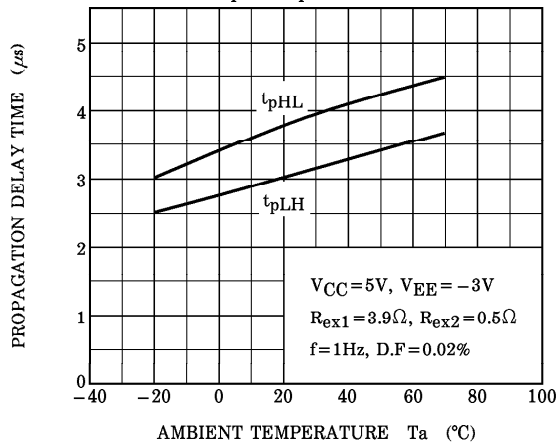
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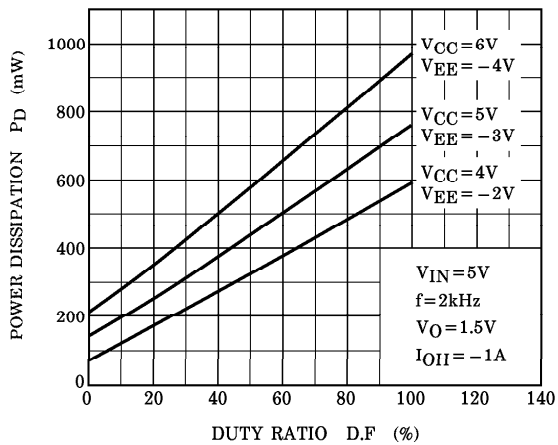
$t_{pLH}, t_{pHL} - V_{IN}$  (Typ.)



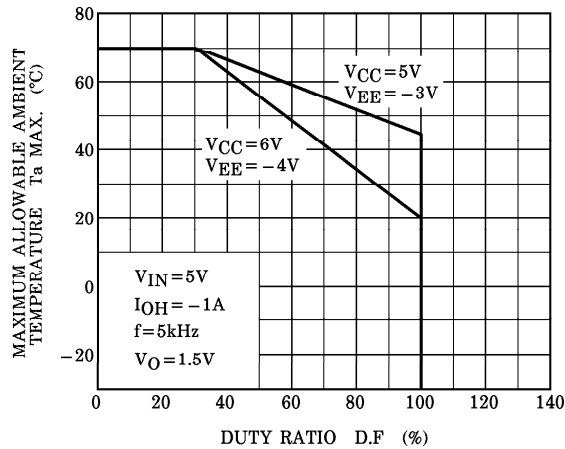
$t_{pLH}, t_{pHL} - T_a$  (Typ.)



$P_D - D.F$  (Typ.)



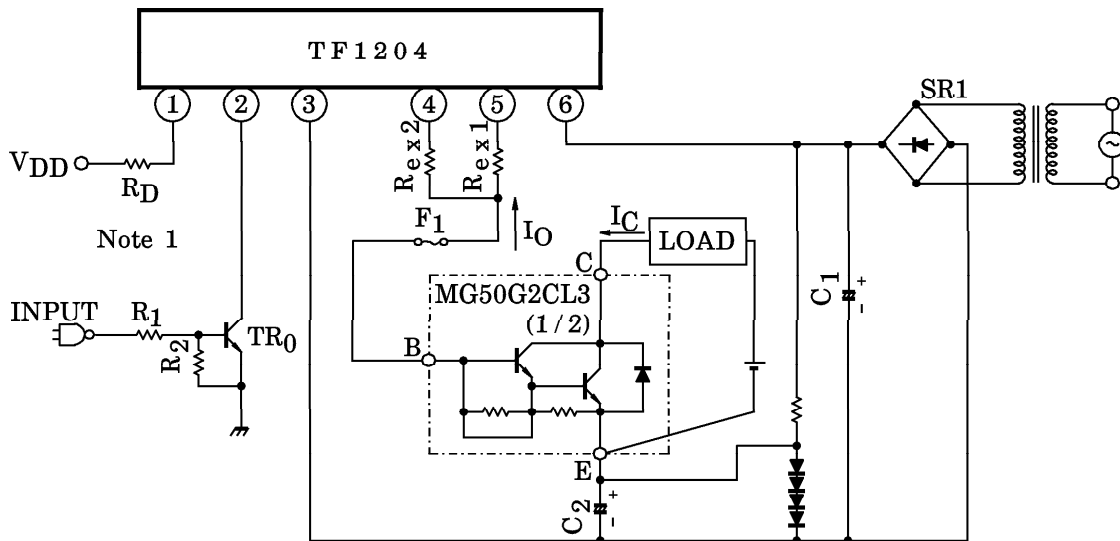
$T_a \text{ MAX.} - D.F$



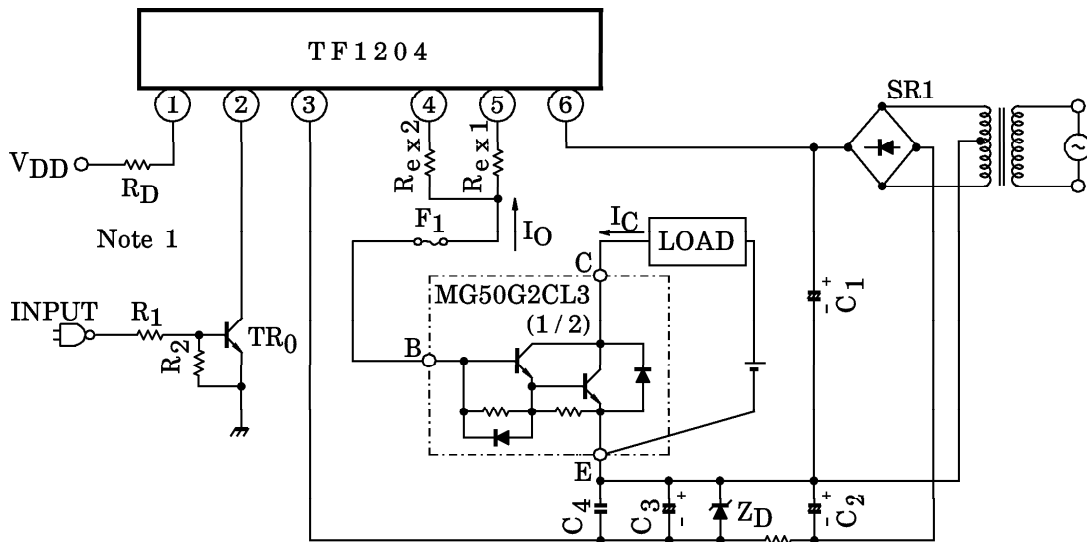
EXAMPLE OF APPLIED CIRCUIT

MG50G2CL3 BASE DRIVE CIRCUIT

(A) SINGLE SOURCE DRIVE



(B) DUAL SOURCE DRIVE



Note 1 : Insert an external resistor  $R_D$  in  $V_{DD}$  bias line when the power supply over 5.5V is used.

(Calculating Formula)

$$R_D = \frac{V_{DD} - V_F}{I_{IN}} - R_{IN}$$

$V_F$  : Forward voltage of LED ( $\approx 1$  [V])  
 $R_{IN}$  : Input resistor (470 [ $\Omega$ ])  
 $I_{IN}$  : Input current (8 [mA])