TOSHIBA SOLID STATE GTR DRIVER MODULE

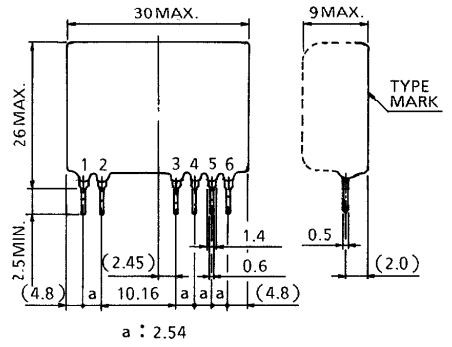
TF1204

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_{RMS} 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



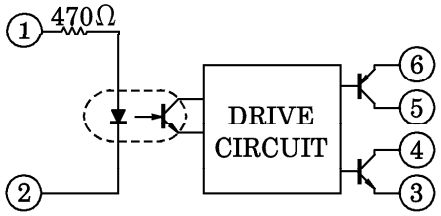
JEDEC	—
EIAJ	—
TOSHIBA	10-30D1A

Weight : 8g

MAXIMUM RATINGS (Ta = 25°C)

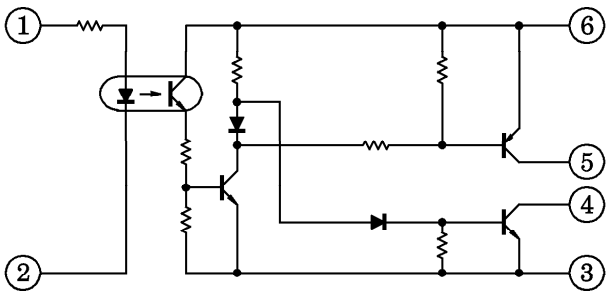
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	6	V
	V_{EE}	−4	V
Input Voltage	V_{IN}	5.5	V
Reverse Input Voltage	V_{RIN}	5	V
High Level Output Current	I_{OH}	−1	A
Low Level Peak Output Current	I_{OLP}	3 (10μs)	A
Isolation (Input-Output)	BV_S / AC	2000 (1min)	V
Operating Frequency	f	5	kHz
Operating Temperature	T_{opr}	−20~70	°C
Storage Temperature	T_{stg}	−20~100	°C

BLOCK DIAGRAM



1. INPUT (+)
2. INPUT (−)
3. OUTPUT 2 (−) 〔V_{EE}〕
4. OUTPUT 2 (+)
5. OUTPUT 1 (−)
6. OUTPUT 1 (+) 〔V_{CC}〕

CIRCUIT DIAGRAM



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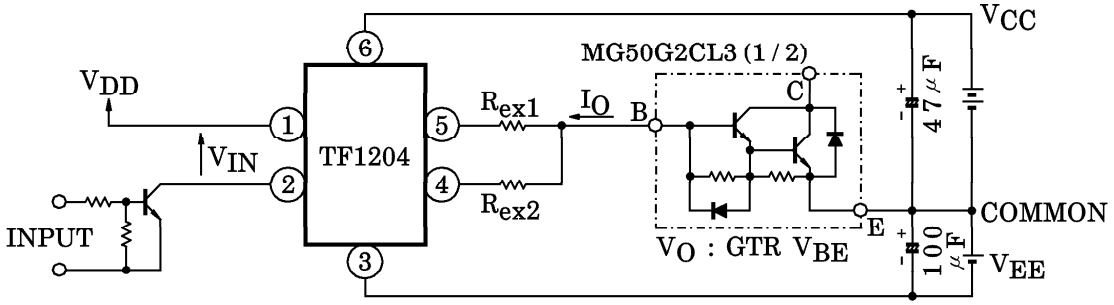
RECOMMENDED OPERATING CONDITIONS (Ta = − 10~50°C)

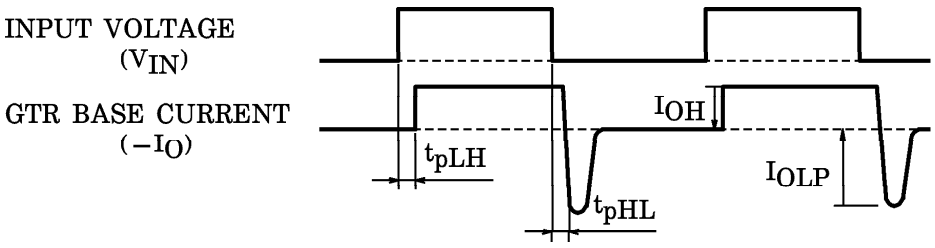
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	—	4.5	5.0	5.5	V
	V_{EE}	—	−2.5	−3.0	−3.5	V
High Level Input Voltage	V_{IH}	—	—	5	—	V
External Resistor	R_{ex1}	—	—	3.9	—	Ω
	R_{ex2}	—	—	0.5	—	Ω
Operating Frequency	f	—	—	2	—	kHz

ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_{CC} = 5V, V_{EE} = − 3V, R_{ex1} = 3Ω, R_{ex2} = 0.22Ω)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Current	I_{IN}	V_{IN} = 5V	7	8	9	mA
High Level Input Voltage	V_{IH}	I_{OH} = −1A	—	2	4.5	V
Low Level Input Voltage	V_{IL}	I_{OLP} = 3A	1.0	2	—	V
High Level Output Current	I_{OH}	V_{IN} = 5V, V_O = 1.5V	—	−1	—	A
Low Level Peak Output Current	I_{OLP}	V_{IN} = 0V	—	3	—	A
(Low→High) Propagation Delay Time	t_{pLH}	V_{IN} = 0→5V	—	3	10	μs
(High→Low) Propagation Delay Time	t_{pHL}	V_{IN} = 5→0V	—	4	10	μs
Power Dissipation	P_D	f = 2kHz, D.f = 50%	—	440	—	mW

TEST CIRCUIT





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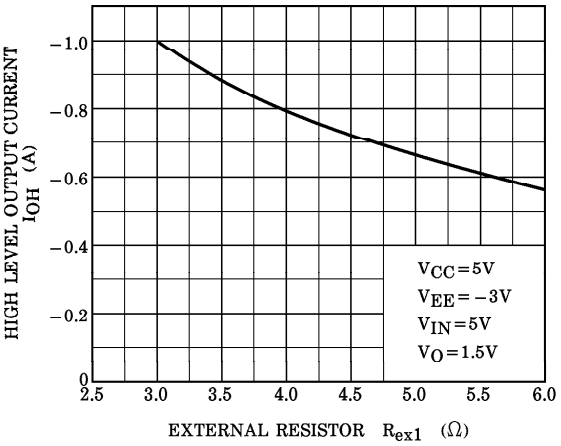
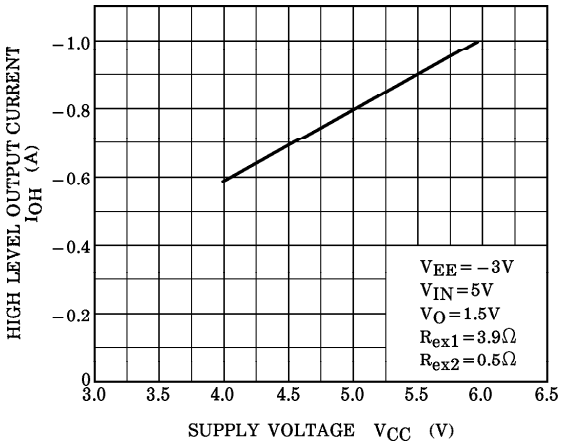
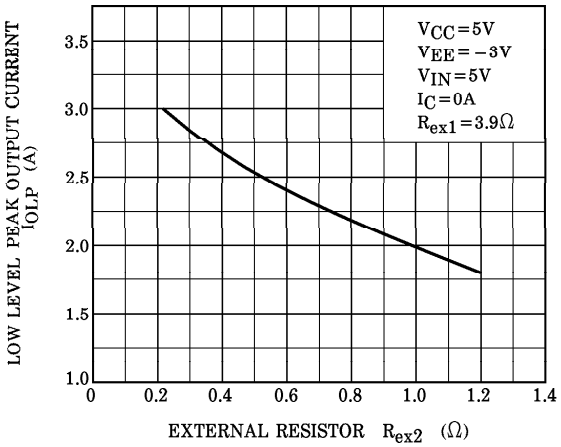
I_{OH} – R_{ex1} (Typ.)



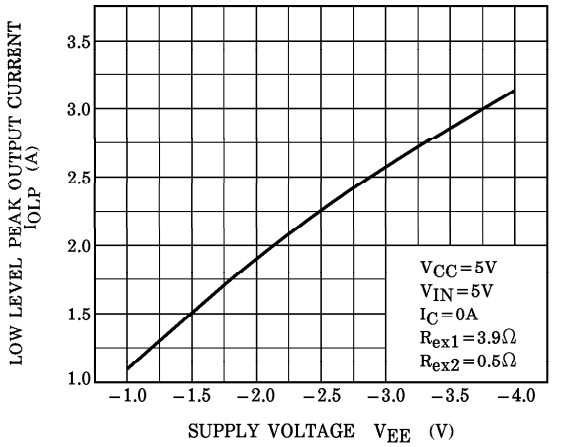
I_{OH} – V_{CC} (Typ.)



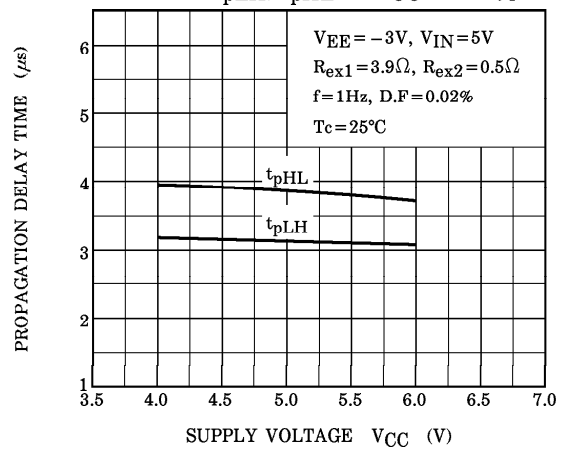
I_{OLP} – R_{ex2} (Typ.)



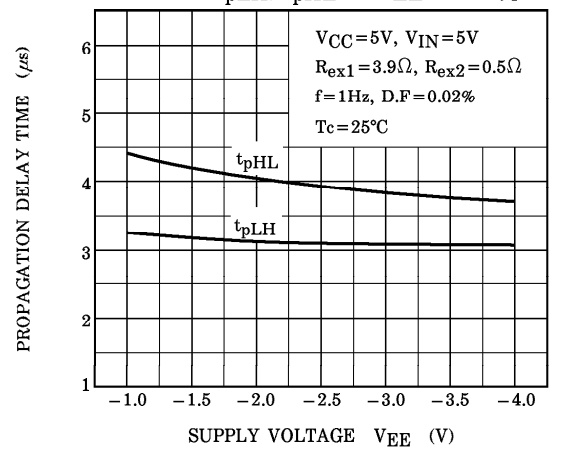
I_{OLP} – V_{EE} (Typ.)



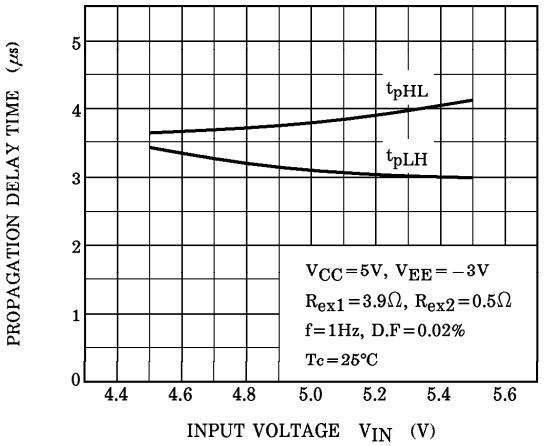
t_{pLH}, t_{pHL} – V_{CC} (Typ.)



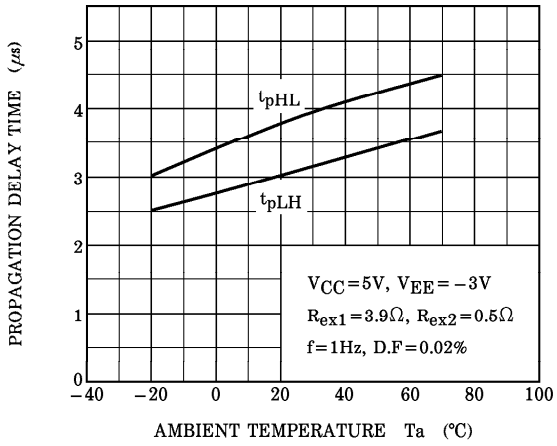
t_{pLH}, t_{pHL} – V_{EE} (Typ.)



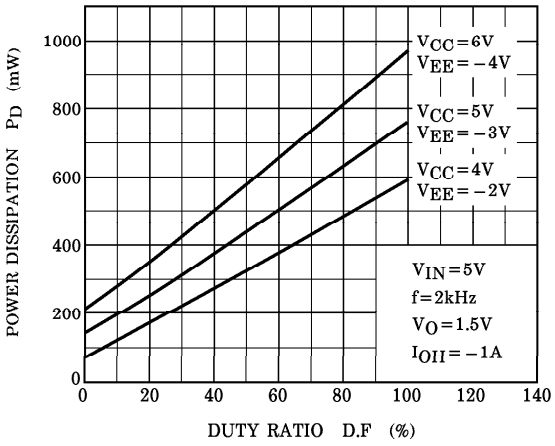
t_{pLH}, t_{pHL} – V_{IN} (Typ.)



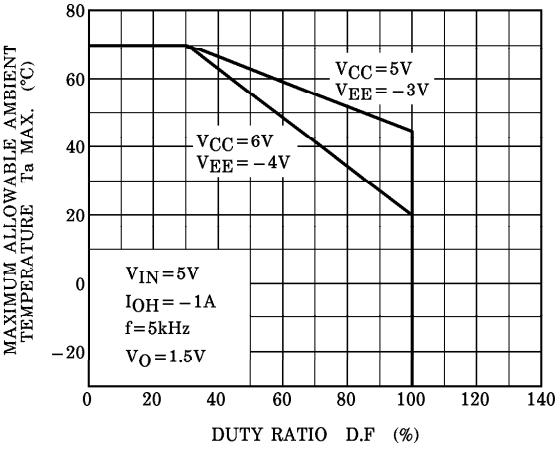
t_{pLH}, t_{pHL} – Ta (Typ.)



P_D – D.F (Typ.)



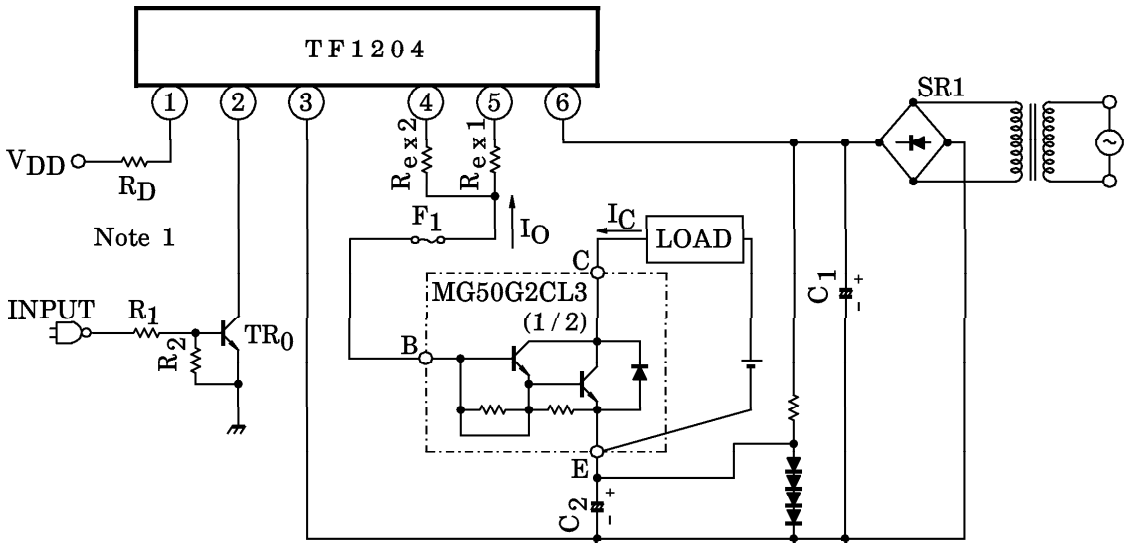
Ta MAX. – D.F



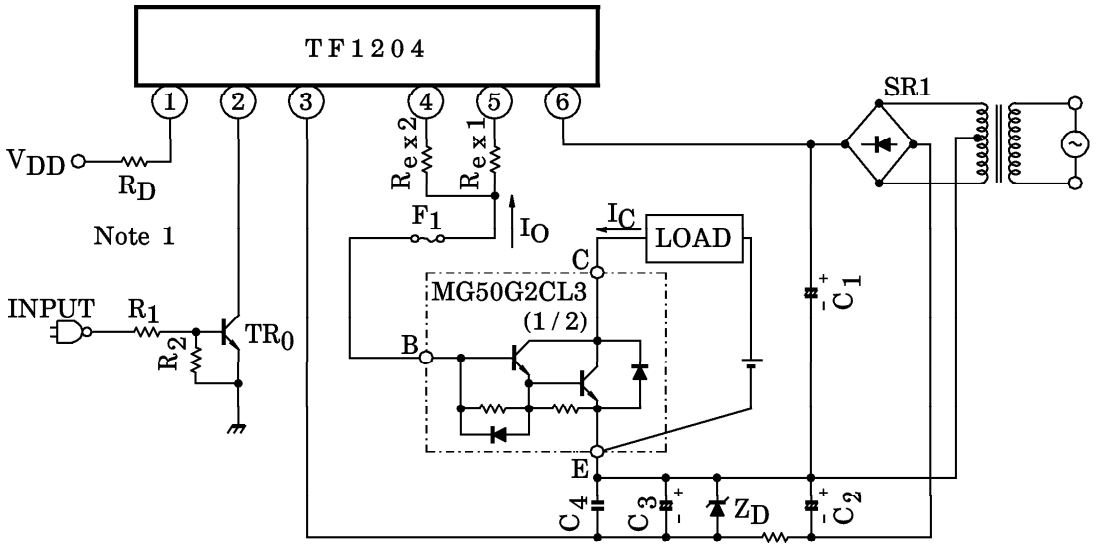
EXAMPLE OF APPLIED CIRCUIT

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 ($\simeq$1 [V])
R_{IN} : Input resistor (470 [Ω])
I_{IN} : Input current (8 [mA])