

TOSHIBA SOLID STATE GTR DRIVER MODULE

TF1203

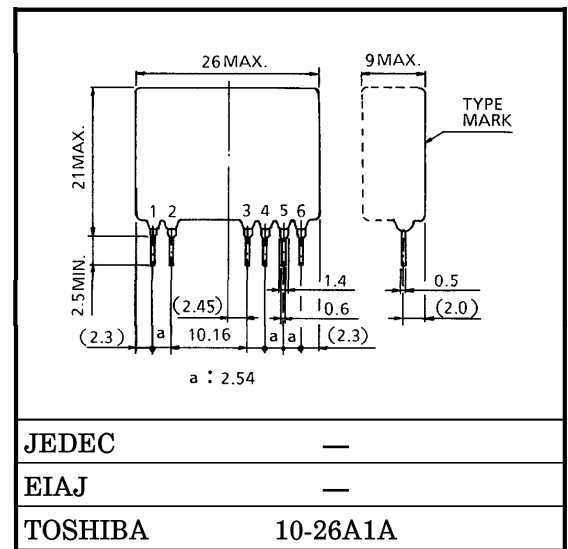
GTR DRIVER

TOSHIBA TF1203 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

Unit in mm

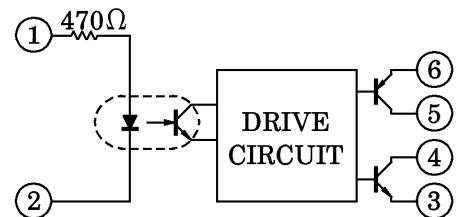


Weight : 5g

MAXIMUM RATINGS (Ta = 25°C)

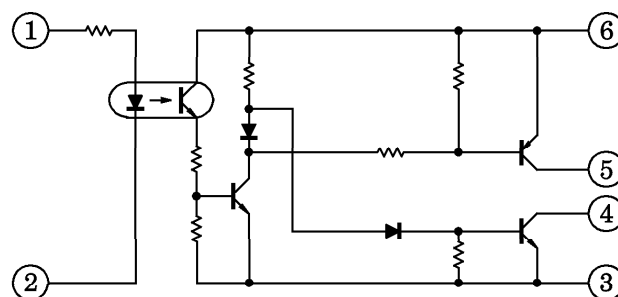
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	6	V
	V _{EE}	-3	V
Input Voltage	V _{IN}	5.5	V
Reverse Input Voltage	V _{RIN}	5	V
High Level Output Current	I _{OH}	-0.5	A
Low Level Peak Output Current	I _{OLP}	1.5 (10μs)	A
Isolation (Input-Output)	BV _S / AC	2000 (1min)	V
Operating Frequency	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



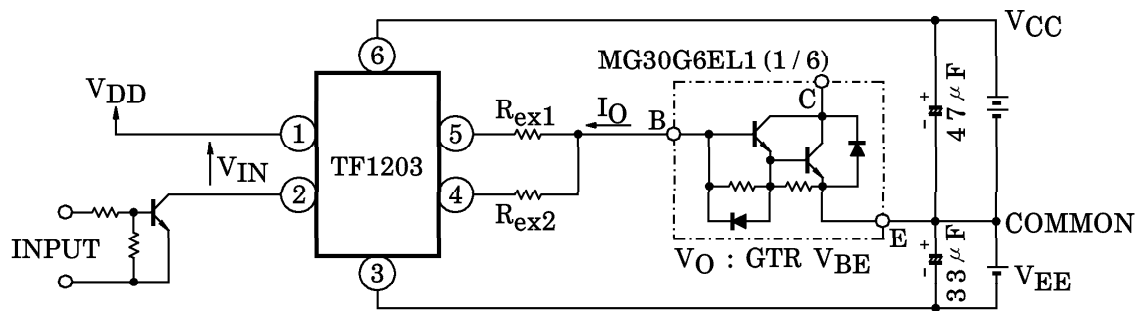
RECOMMENDED OPERATING CONDITIONS ($T_a = -10 \sim 50^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	—	4.5	5.0	5.5	V
	V_{EE}	—	-1.5	-2	-2.5	V
High Level Input Voltage	V_{IH}	—	—	5	—	V
External Resistor	R_{ex1}	—	—	8.5	—	Ω
	R_{ex2}	—	—	0.5	—	Ω
Operating Frequency	f	—	—	2	—	kHz

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$, $V_{EE} = -2\text{V}$, $R_{ex1} = 6.5\Omega$, $R_{ex2} = 0.5\Omega$)

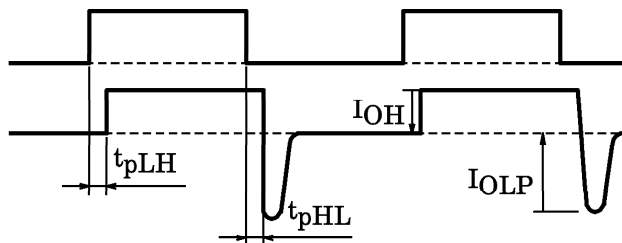
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Current	I_{IN}	$V_{IN} = 5\text{V}$	7	8	9	mA
High Level Input Voltage	V_{IH}	$I_{OH} = -0.5\text{A}$	—	2	4.5	V
Low Level Input Voltage	V_{IL}	$I_{OLP} = 1.4\text{A}$	1.0	2	—	V
High Level Output Current	I_{OH}	$V_{IN} = 5\text{V}$, $V_O = 1.4\text{V}$	—	-0.5	—	A
Low Level Peak Output Current	I_{OLP}	$V_{IN} = 0\text{V}$	—	1.4	—	A
(Low→High) Propagation Delay Time	t_{pLH}	$V_{IN} = 0 \rightarrow 5\text{V}$	—	3	10	μs
(High→Low) Propagation Delay Time	t_{pHL}	$V_{IN} = 5 \rightarrow 0\text{V}$	—	4	10	μs
Power Dissipation	P_D	$f = 2\text{kHz}$, $D.f = 50\%$	—	210	—	mW

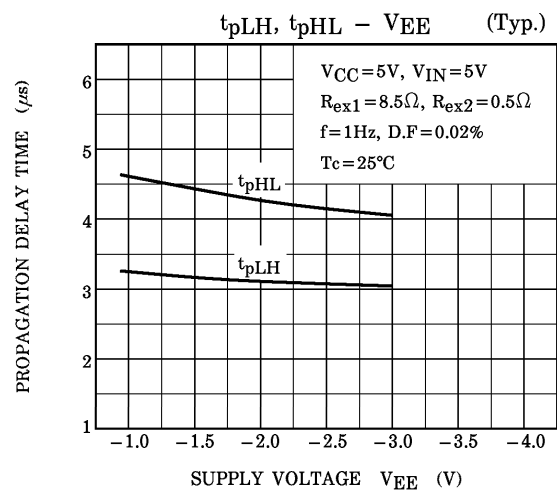
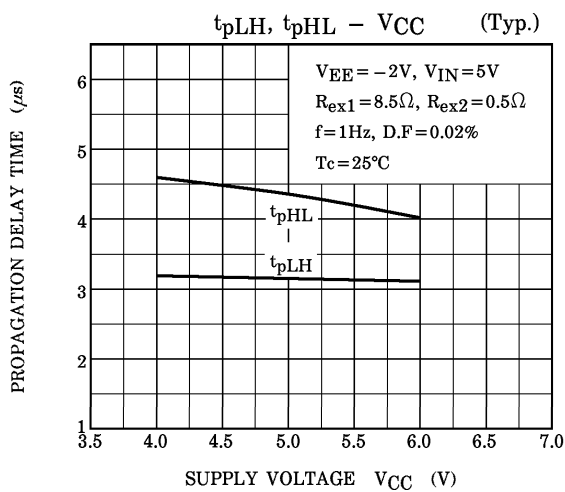
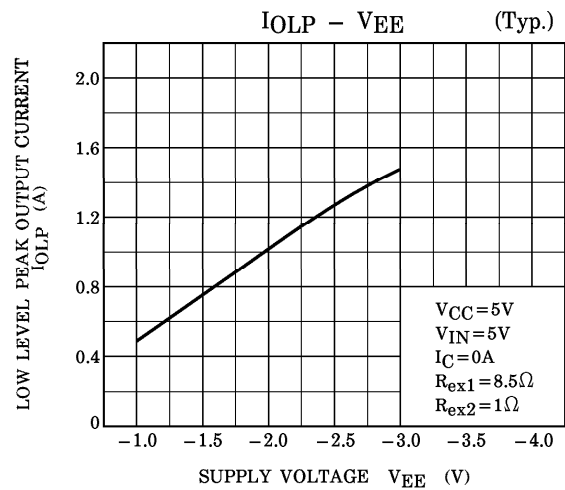
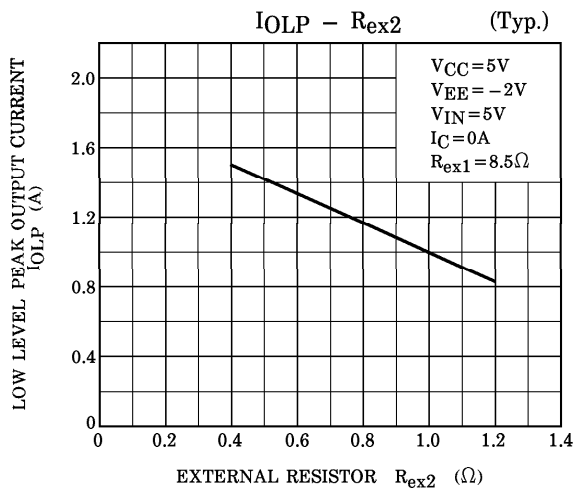
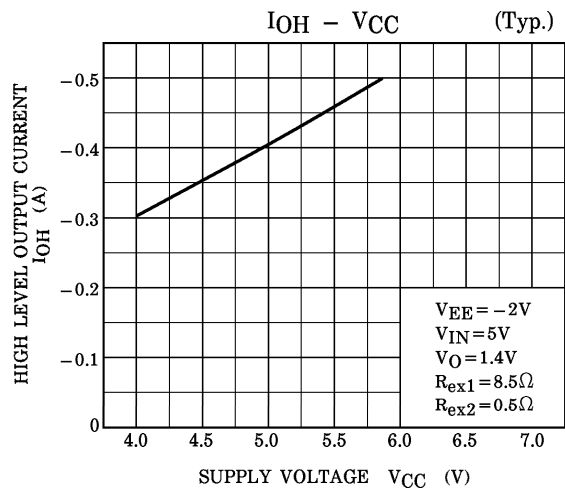
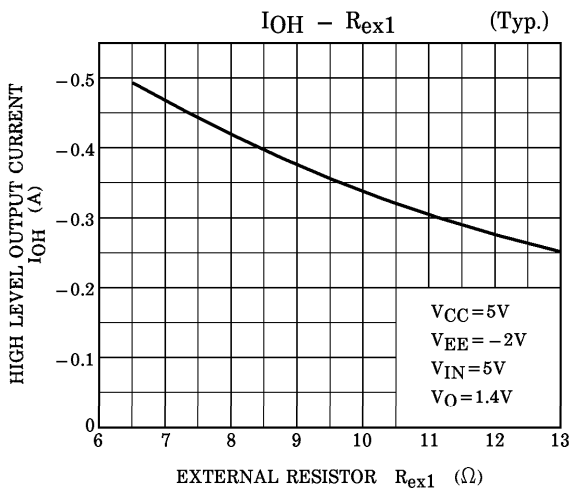
TEST CIRCUIT

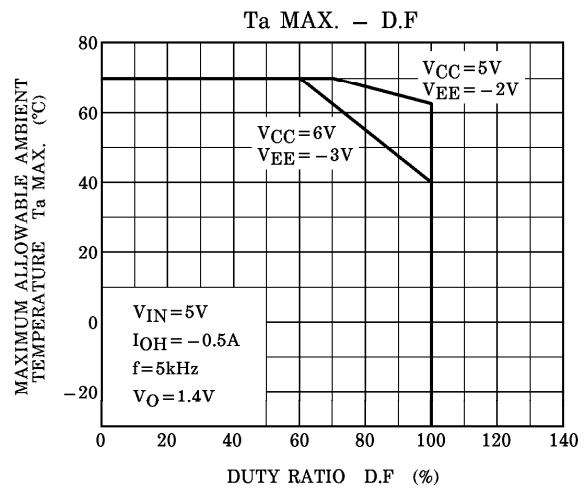
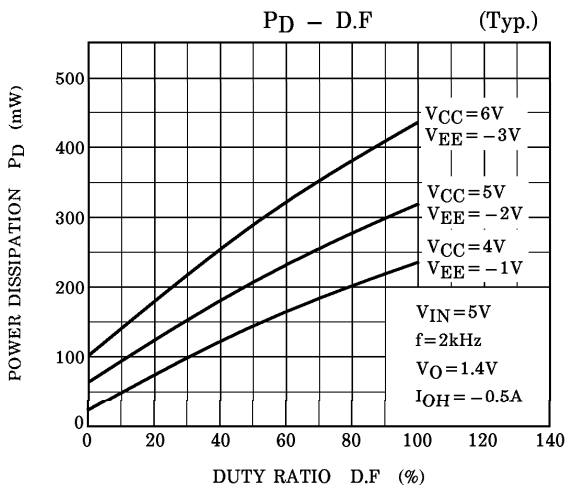
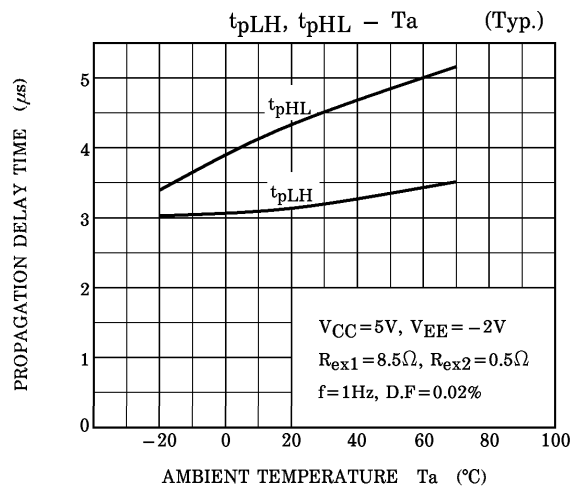
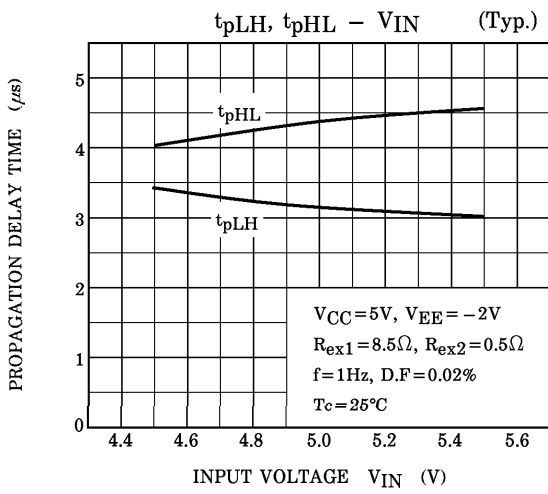


INPUT VOLTAGE
(V_{IN})

GTR BASE CURRENT
($-I_O$)



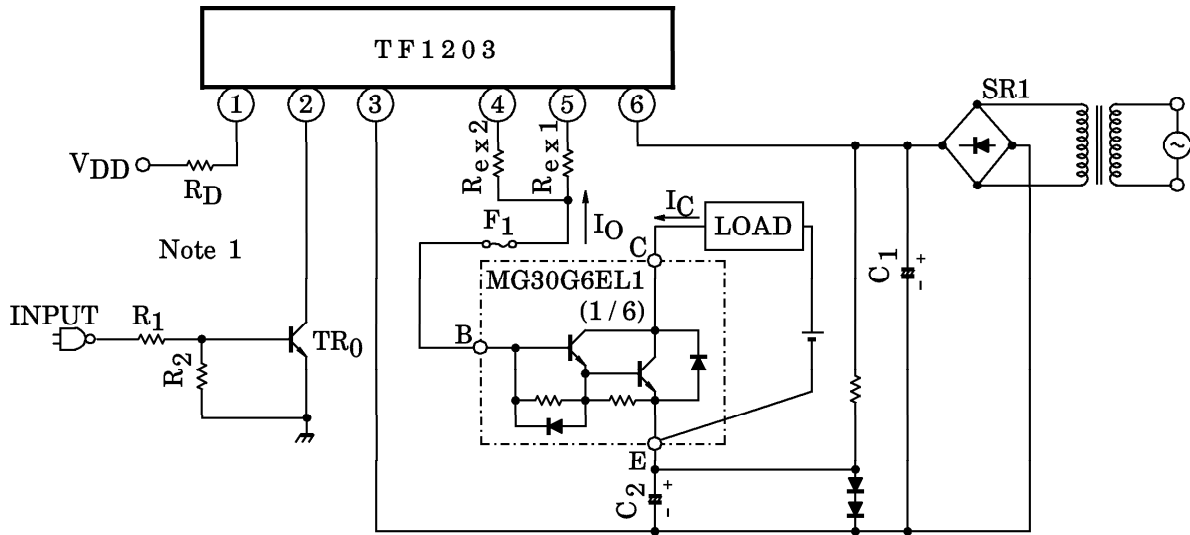




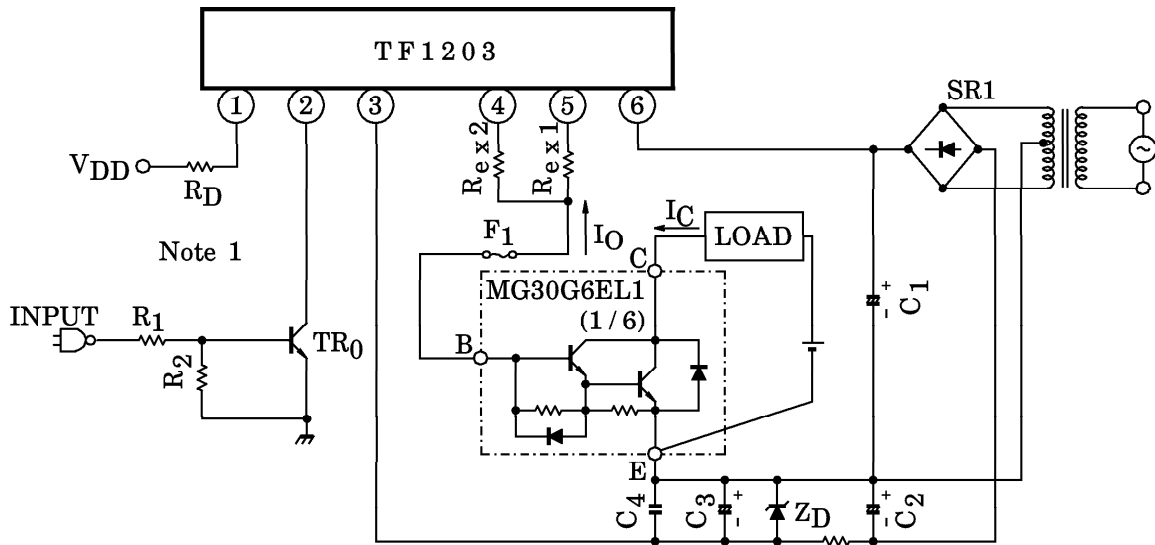
EXAMPLE OF APPLIED CIRCUIT

MG30G6EL1 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 in used.

(Calculating Formula)

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

V_F : Forward voltage of LED (≈ 1 [V])
 R_{IN} : Input resistor (470 [Ω])
 I_{IN} : Input current (8 [mA])

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