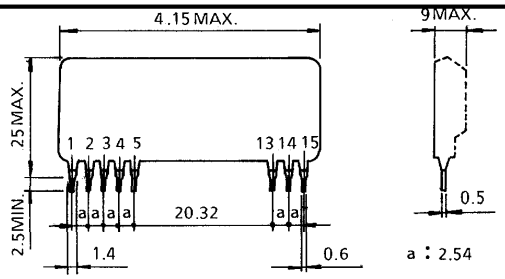
TOSHIBA SOLID STATE IGBT GATE DRIVER MODULE

TF1207

TOSHIBA TF1207 is the IGBT gate driver designed for use with TOSHIBA Insulated Gate Bipolar Transistor odule and it includes the optical isolator and IGBT gate driver circuit. Using this driver, you can design high reliability and compact system.

- Recommended Conditions :
  Input Supply Voltage : V_C=5V
  Output Supply Voltage : V_{CC}=15V, V_{EE}=−15V
- High Speed Switching Response :
  t_{pLH}=1.5μs (Typ.)
  t_{pHL}=0.8μs (Typ.)
- Small Size and Light Weight
- Including Input-Buffer
- 2500 V_{AC} Optical Isolation

Unit in mm



1 : OUTPUT 1
2 : V_{CC}
3 : OUTPUT 2
4 : V_{EE}
5 : V_Z
13 : GND
14 : V_C
15 : INPUT

JEDEC	—
EIAJ	—
TOSHIBA	10-42A1A

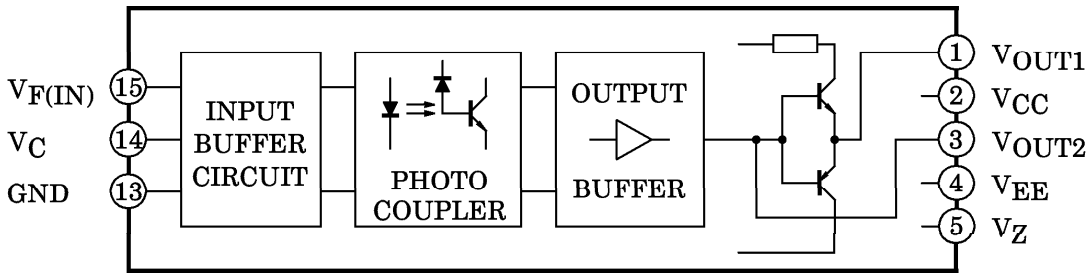
Weight : 8g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Supply Voltage	V_C	6	V
Input Voltage	$V_{F(IN)}$	−0.5~V_C+0.5	
Output Supply Voltage	V_{CC}	18	V
	V_{EE}	−18	
Output Voltage	V_{OUT}	V_{CC}~V_{EE}	V
High Level Peak Output Current (Note 1)	I_{OHP}	2 (10μs)	A
Low Level Peak Output Current (Note 1)	I_{OLP}	−3 (10μs)	A
Operating Frequency (Note 2)	f	15	kHz
Isolation (Input-Output)	BV_S / AC	2500 (1min)	V
Operating Temperature	T_{opr}	−20~70	°C
Storage Temperature	T_{stg}	−20~85	°C
Lead Soldering Temperature	T_{sol}	260°C (10s)	°C

Note 1 : Exponential Waveform (f=10kHz, Fig.1)
Note 2 : I_{OHP}=2A (5μs), I_{OLP}=−3A (5μs), Exponential Waveform (Fig.1)

BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_C = 5V, V_{CC} = 15V, V_{EE} = −15V, R_L = 500Ω, f = 10kHz)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
High Level Input Voltage	V_{FT}	V_{OUT1} > 0V (Fig.2, 3)	0.5	1.5	—	V
High Level Input Current	I_{FT}	V_{OUT1} > 0V (Fig.2, 3)	−1.0	−0.5	—	mA
Input Impedance	$Z_{(IN)}$	$V_{F(IN)}$ = 0	—	10	—	kΩ
High Level Output Voltage	V_{OH}	$V_{F(IN)}$ = 5→0V, R_L = 200Ω (Fig.2, 3)	13	13.5	—	V
Low Level Output Voltage	V_{OL}	$V_{F(IN)}$ = 0→5V, R_L = 200Ω (Fig.2, 3)	—	−13.5	−13	
High Level Supply Current	I_{CCH}	$V_{F(IN)}$ = 5→0V, V_{OUT1} > 0V (Fig.2, 3)	—	11	—	mA
Low Level Supply Current	I_{CCL}	$V_{F(IN)}$ = 0→5V, V_{OUT1} < 0V (Fig.2, 3)	—	10	—	
Zener Voltage (Coupler Supply)	V_Z	I_Z = 20mA, 4pin to 5pin	—	5.1	—	V
Propagation Delay Time to High Output Level	t_{pLH}	$V_{F(IN)}$ = 5→0V, V_{OUT1} > 0V, R_L = 200Ω (Fig.2, 3)	—	1.5	2.0	μs
Output Rise Time	t_r		—	0.25	—	
Propagation Delay Time to Low Output Level	t_{pHL}	$V_{F(IN)}$ = 5→0V, V_{OUT1} < 0V, R_L = 200Ω (Fig.2, 3)	—	0.8	1.5	μs
Output Fall Time	t_f		—	0.10	—	
Isolation Resistance (Input-Output)	R_S	V = 1kV, RH = 40~60%	—	10^{10}	—	Ω

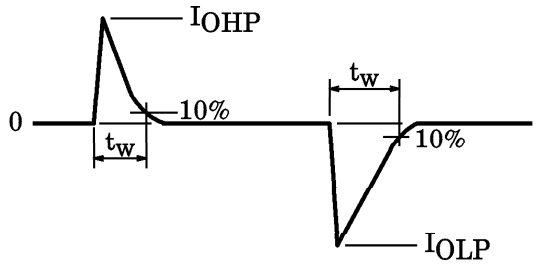


Fig.1 EXPONENTIAL WAVEFORM

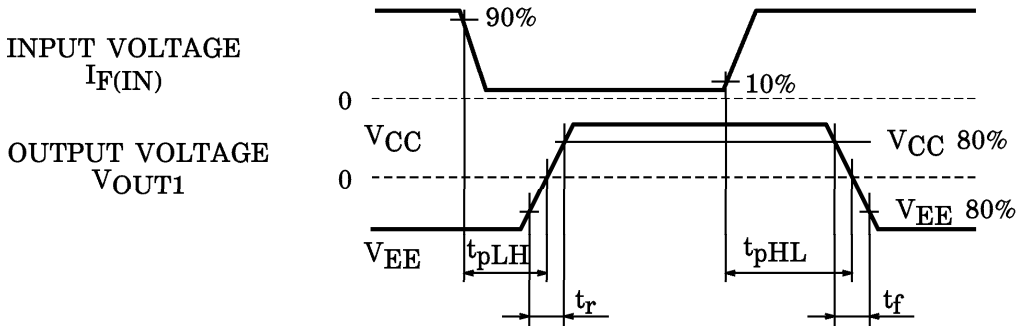


Fig.2 SWITCHING TIME TEST CONDITION

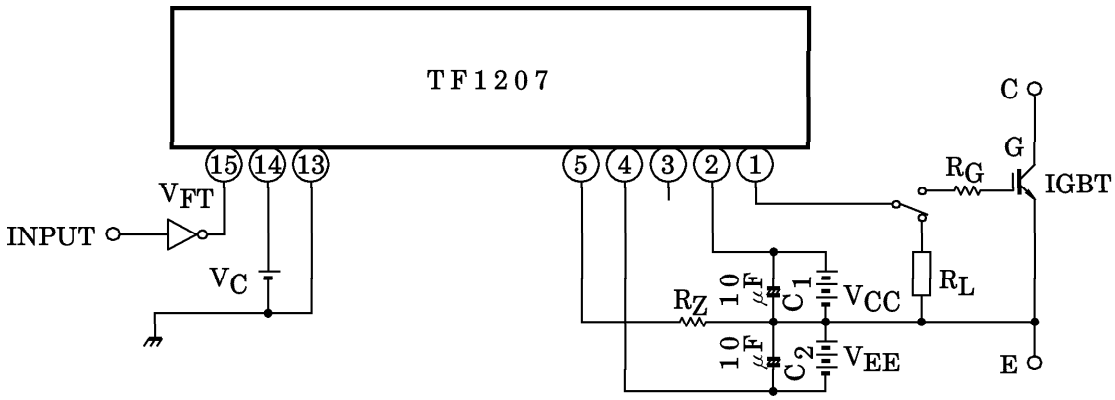
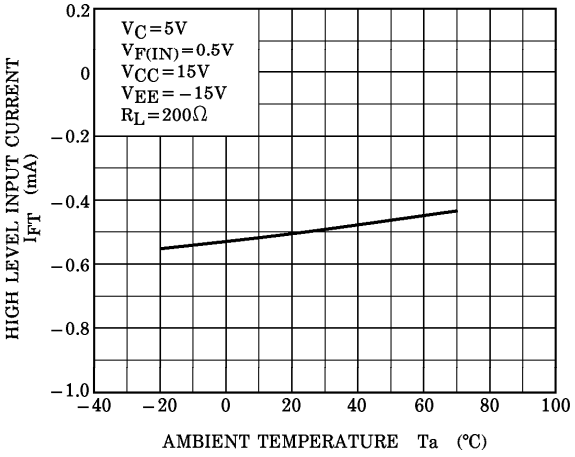
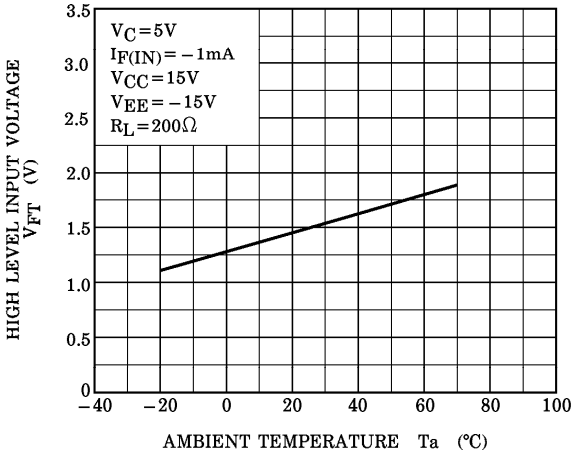


Fig.3 SWITCHING TIME TEST CIRCUIT

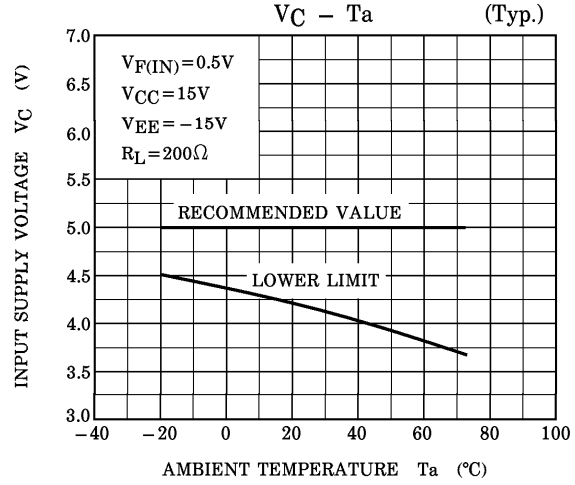
I_{FT} – Ta (Typ.)



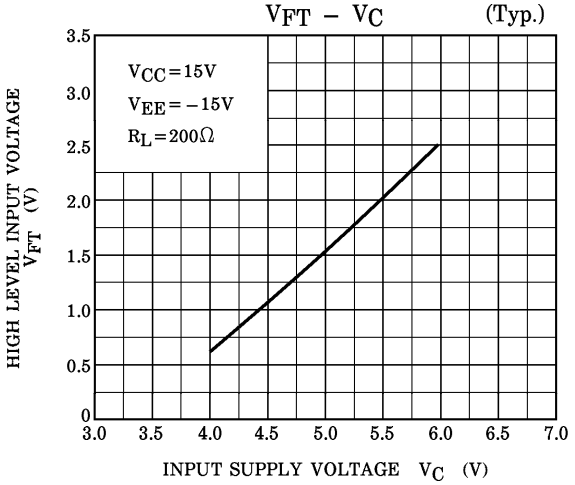
V_{FT} – Ta (Typ.)



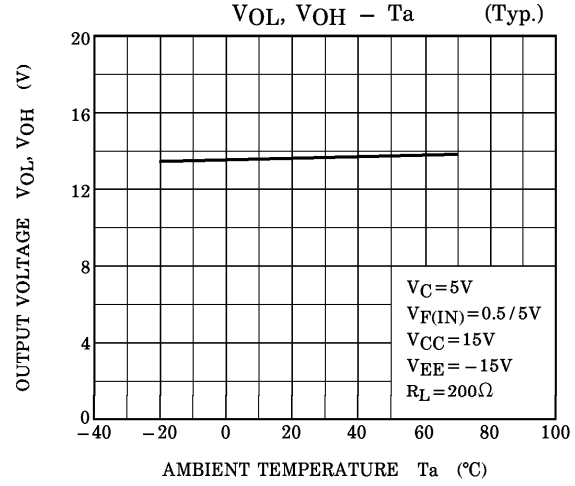
V_C – Ta (Typ.)



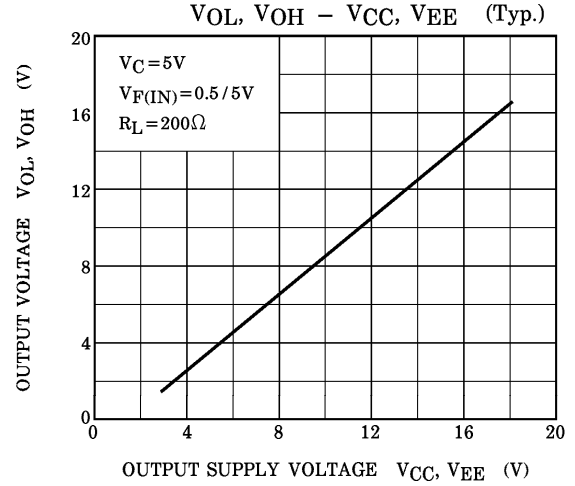
V_{FT} – V_C (Typ.)



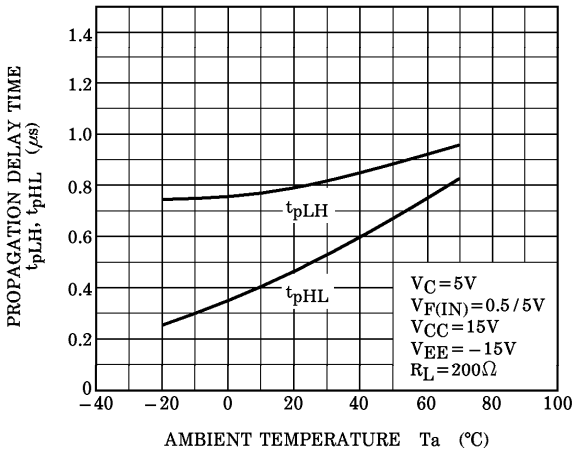
V_{OL}, V_{OH} – Ta (Typ.)



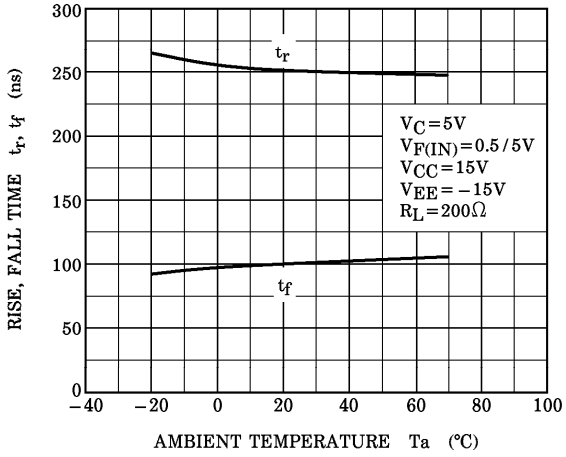
V_{OL}, V_{OH} – V_{CC}, V_{EE} (Typ.)



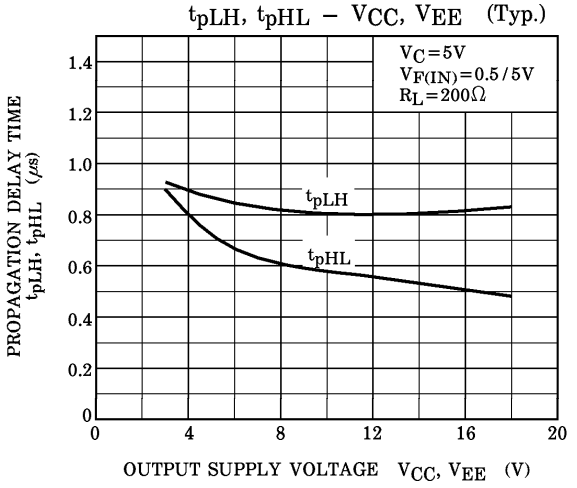
t_{pLH}, t_{pHL} – Ta (Typ.)



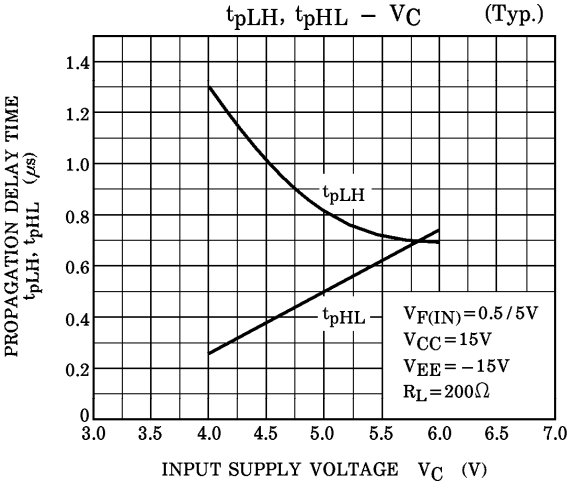
t_r, t_f – Ta (Typ.)



t_{pLH}, t_{pHL} – V_{CC}, V_{EE} (Typ.)



t_{pLH}, t_{pHL} – V_C (Typ.)



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