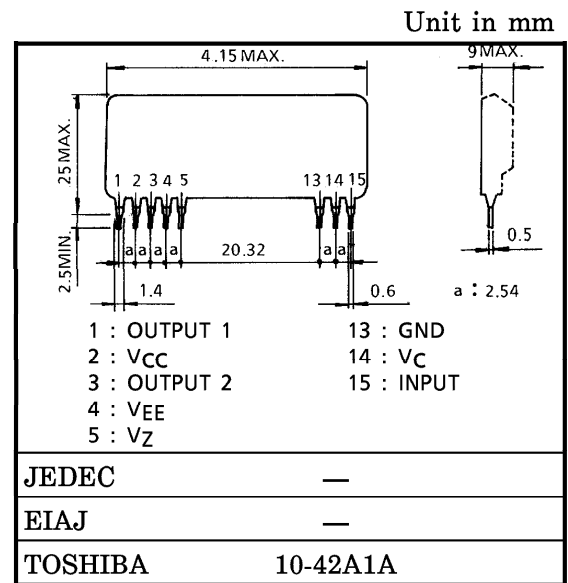


TOSHIBA SOLID STATE IGBT GATE DRIVER MODULE

TF1205

TOSHIBA TF1205 is the IGBT gate driver designed for use with TOSHIBA Insulated Gate Bipolar Transistor Module 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 :
 $t_{pLH}=0.5\mu s$ (Typ.)
 $t_{pHL}=0.4\mu s$ (Typ.)
- Small Size and Light Weight
- 2500 V_{AC} Optical Isolation
- Including Input-Buffer



Weight : 8g

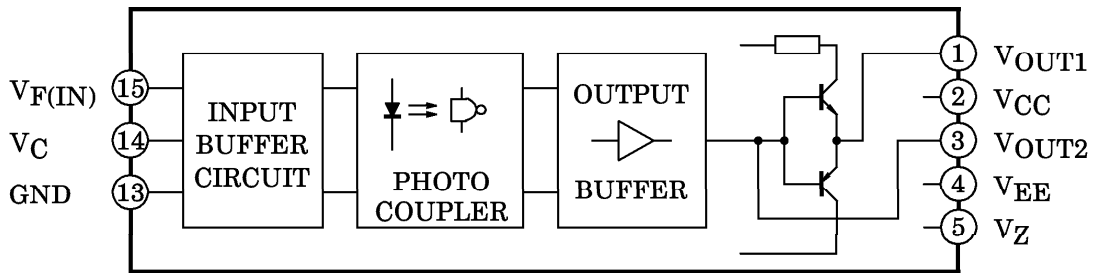
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Supply Voltage	V_C	6	V
Input Voltage	$V_{F(IN)}$	$-0.5 \sim V_C + 0.5$	
Output Supply Voltage	V_{CC}	18	V
	V_{EE}	-18	
Output Voltage	V_{OUT}	$V_{CC} \sim V_{EE}$	V
High Level Peak Output Current (Note 1)	I_{OHP}	2 (10 μs)	A
Low Level Peak Output Current (Note 1)	I_{OLP}	-3 (10 μs)	A
Operating Frequency (Note 2)	f	30	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=15kHz, Fig.1)

Note 2 : $I_{OHP}=2A$ (5 μs), $I_{OLP}=-3A$ (5 μs), Exponential Waveform (Fig.1)

BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS (Ta = 25°C, VC = 5V, VCC = 15V, VEE = -15V, RZ = 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)	—	25	—	mA
Low Level Supply Current	I _{CCL}	V _{F(IN)} = 0 → 5V, V _{OUT1} < 0V (Fig.2, 3)	—	20	—	
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)	—	0.5	1.0	μs
Output Rise Time	t _r		—	0.25	—	
Propagation Delay Time to Low Output Level	t _{pHL}	V _{F(IN)} = 0 → 5V, V _{OUT1} < 0V, R _L = 200Ω (Fig.2, 3)	—	0.4	0.8	μs
Output Fall Time	t _f		—	0.10	—	
Common Mode Transient Immunity at Logic High Output	CM _H	V _{CM} = 400V	1	10	—	kV / μs
Isolation Resistance (Input-Output)	R _S	V = 1kV, RH = 40~60%	—	10 ¹⁰	—	Ω

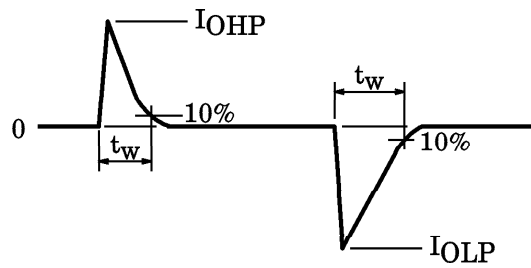


Fig.1 EXPONENTIAL WAVEFORM

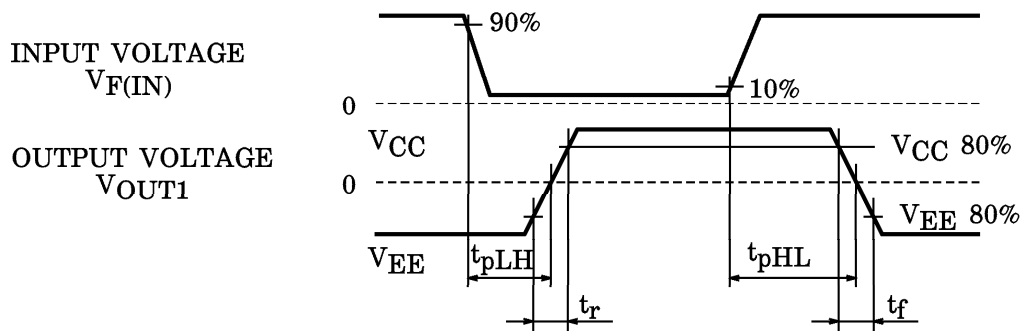


Fig.2 SWITCHING TIME TEST CONDITION

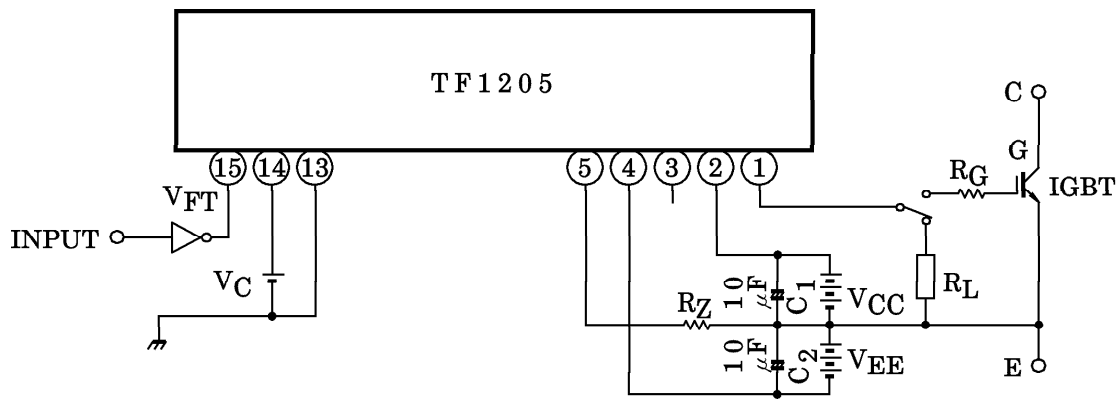
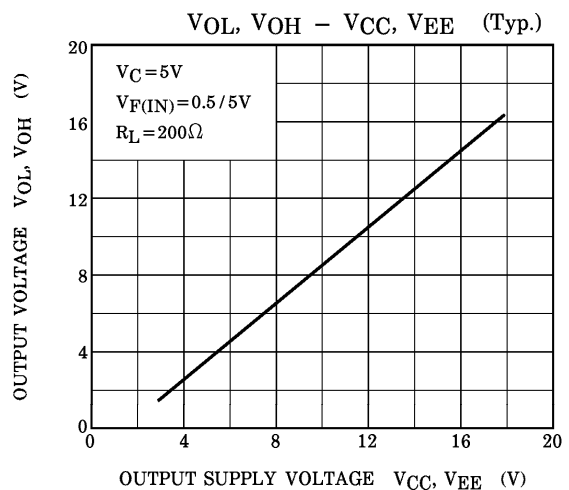
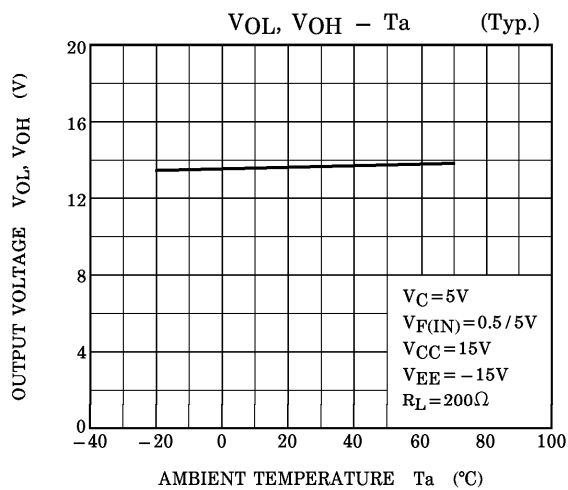
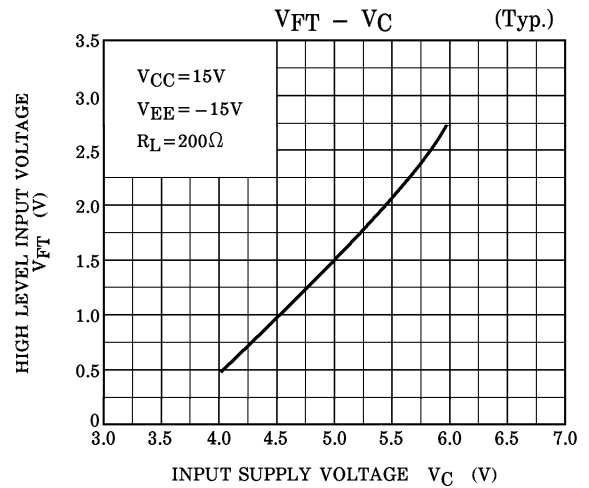
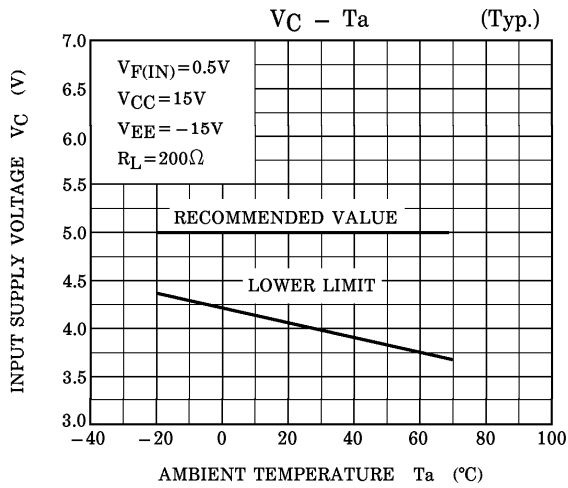
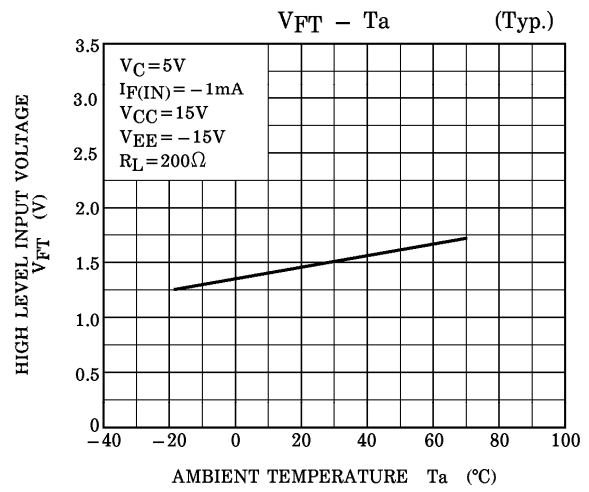
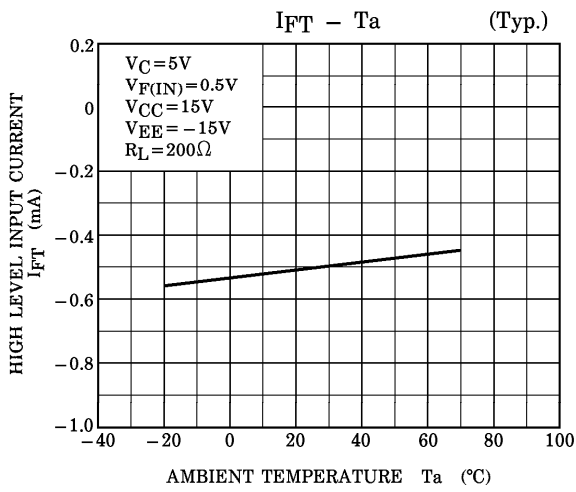
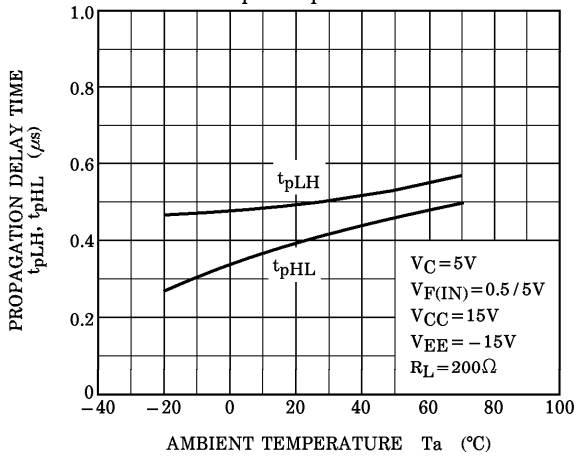


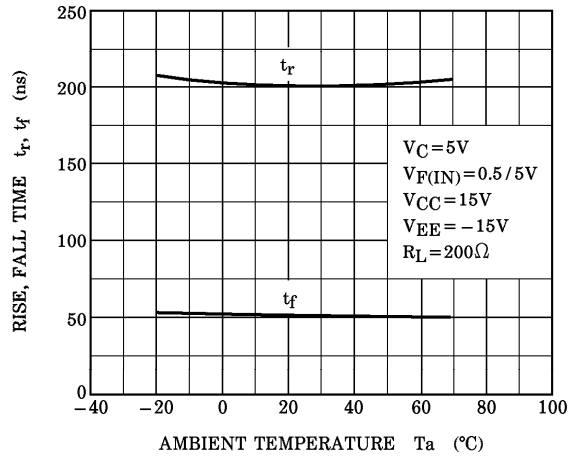
Fig.3 SWITCHING TIME TEST CIRCUIT



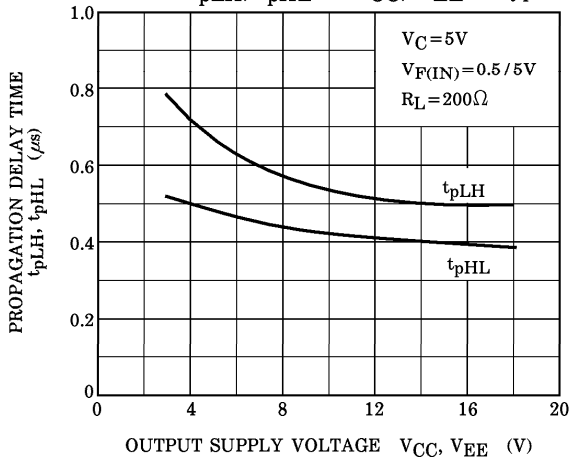
$t_{pLH}, t_{pHL} - T_a$ (Typ.)



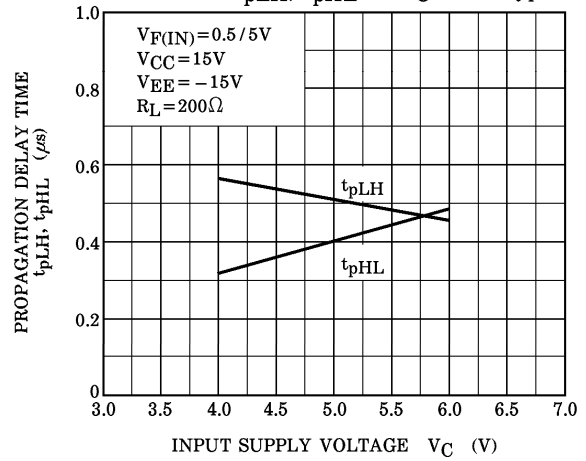
$t_r, t_f - T_a$ (Typ.)



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



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



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