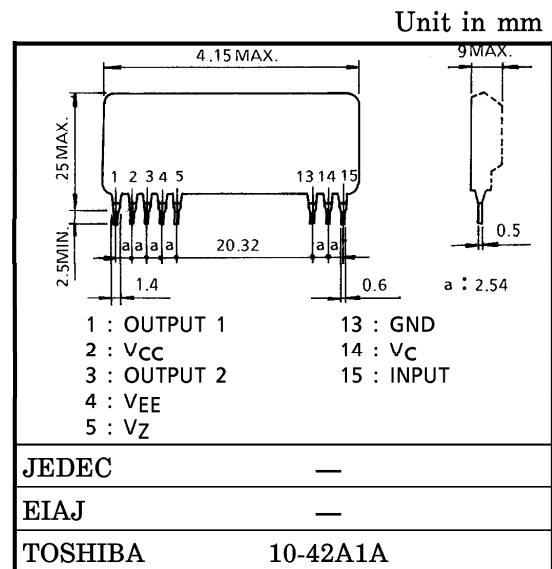


TOSHIBA SOLID STATE IGBT GATE DRIVER MODULE

# TF1207

TOSHIBA TF1207 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 :  
 $t_{pLH}=1.5\mu s$  (Typ.)  
 $t_{pHL}=0.8\mu s$  (Typ.)
- Small Size and Light Weight
- Including Input-Buffer
- 2500 V<sub>AC</sub> Optical Isolation



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	$V_{OUT}$	$V_{CC} \sim V_{EE}$	V
High Level Peak Output Current (Note 1)	$I_{OHP}$	2 (10 $\mu s$ )	A
Low Level Peak Output Current (Note 1)	$I_{OLP}$	-3 (10 $\mu s$ )	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

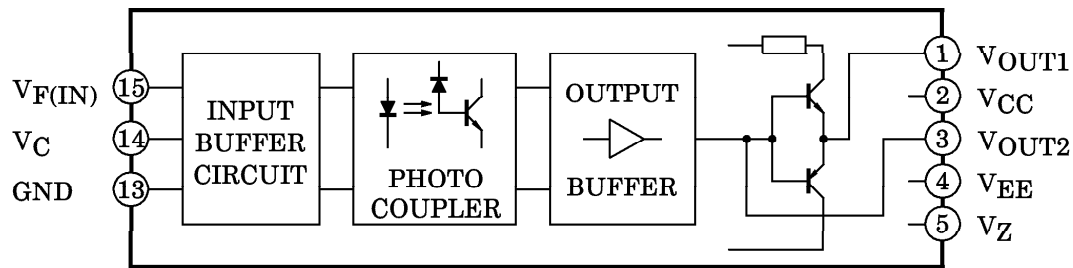
Note 1 : Exponential Waveform (f=10kHz, Fig.1)

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

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BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS (Ta = 25°C, VC = 5V, VCC = 15V, VEE = -15V, RL = 500Ω, f = 10kHz)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
High Level Input Voltage	V <sub>FT</sub>	V <sub>OUT1</sub> > 0V (Fig.2, 3)	0.5	1.5	—	V
High Level Input Current	I <sub>FT</sub>	V <sub>OUT1</sub> > 0V (Fig.2, 3)	-1.0	-0.5	—	mA
Input Impedance	Z <sub>(IN)</sub>	V <sub>F(IN)</sub> = 0	—	10	—	kΩ
High Level Output Voltage	V <sub>OH</sub>	V <sub>F(IN)</sub> = 5 → 0V, R <sub>L</sub> = 200Ω (Fig.2, 3)	13	13.5	—	V
Low Level Output Voltage	V <sub>OL</sub>	V <sub>F(IN)</sub> = 0 → 5V, R <sub>L</sub> = 200Ω (Fig.2, 3)	—	-13.5	-13	
High Level Supply Current	I <sub>CCH</sub>	V <sub>F(IN)</sub> = 5 → 0V, V <sub>OUT1</sub> > 0V (Fig.2, 3)	—	11	—	mA
Low Level Supply Current	I <sub>CCL</sub>	V <sub>F(IN)</sub> = 0 → 5V, V <sub>OUT1</sub> < 0V (Fig.2, 3)	—	10	—	
Zener Voltage (Coupler Supply)	V <sub>Z</sub>	I <sub>Z</sub> = 20mA, 4pin to 5pin	—	5.1	—	V
Propagation Delay Time to High Output Level	t <sub>pLH</sub>	V <sub>F(IN)</sub> = 5 → 0V, V <sub>OUT1</sub> > 0V, R <sub>L</sub> = 200Ω (Fig.2, 3)	—	1.5	2.0	μs
Output Rise Time	t <sub>r</sub>		—	0.25	—	
Propagation Delay Time to Low Output Level	t <sub>pHL</sub>	V <sub>F(IN)</sub> = 5 → 0V, V <sub>OUT1</sub> < 0V, R <sub>L</sub> = 200Ω (Fig.2, 3)	—	0.8	1.5	μs
Output Fall Time	t <sub>f</sub>		—	0.10	—	
Isolation Resistance (Input-Output)	R <sub>S</sub>	V = 1kV, RH = 40~60%	—	10 <sup>10</sup>	—	Ω

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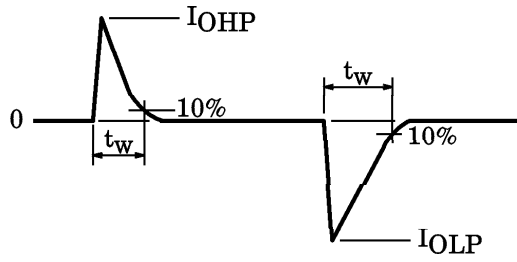


Fig.1 EXPONENTIAL WAVEFORM

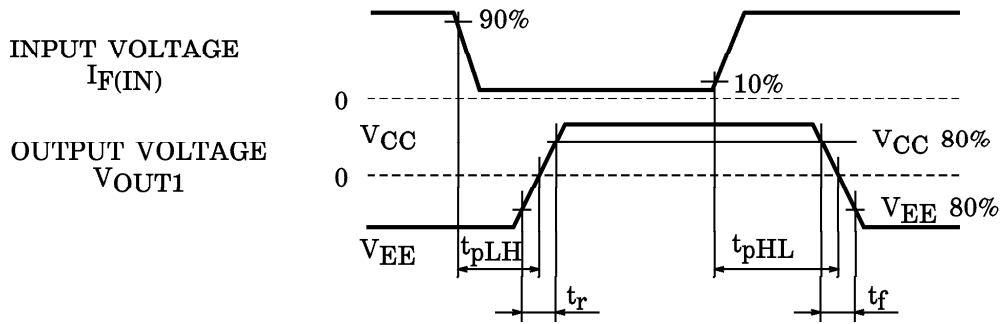


Fig.2 SWITCHING TIME TEST CONDITION

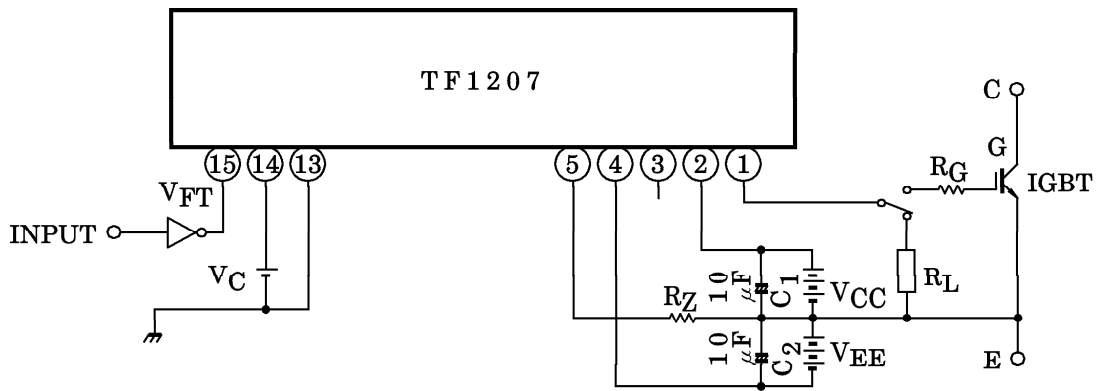


Fig.3 SWITCHING TIME TEST CIRCUIT

