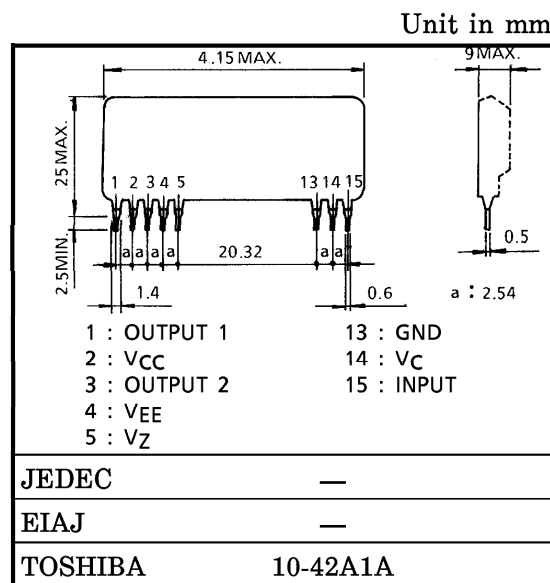


TOSHIBA SOLID STATE IGBT GATE DRIVER MODULE

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_{AC} Optical Isolation



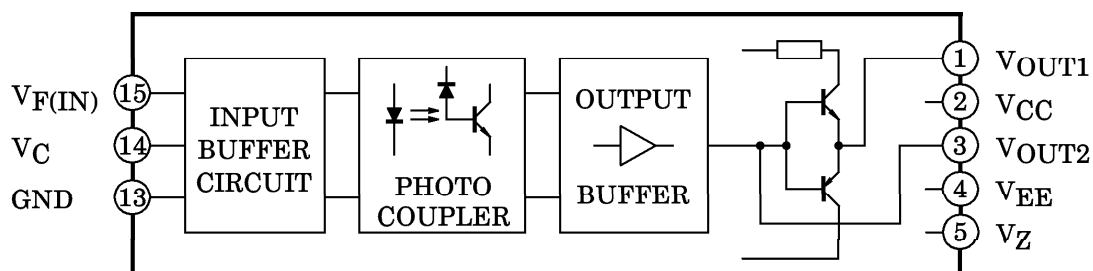
Weight : 8g

MAXIMUM RATINGS ($T_a = 25^\circ C$)

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	15	kHz
Isolation (Input-Output)	BV_S / AC	2500 (1min)	V
Operating Temperature	T_{opr}	-20~70	$^\circ C$
Storage Temperature	T_{stg}	-20~85	$^\circ C$
Lead Soldering Temperature	T_{sol}	260 $^\circ C$ (10s)	$^\circ C$

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

BLOCK DIAGRAM

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, $V_C = 5\text{V}$, $V_{CC} = 15\text{V}$, $V_{EE} = -15\text{V}$, $R_L = 500\Omega$, $f = 10\text{kHz}$)

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

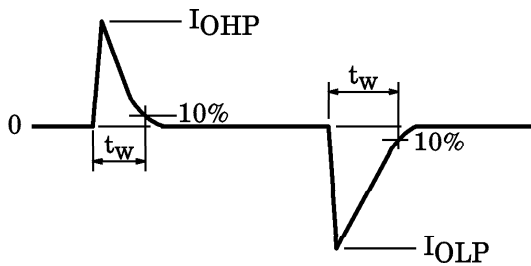


Fig.1 EXPONENTIAL WAVEFORM

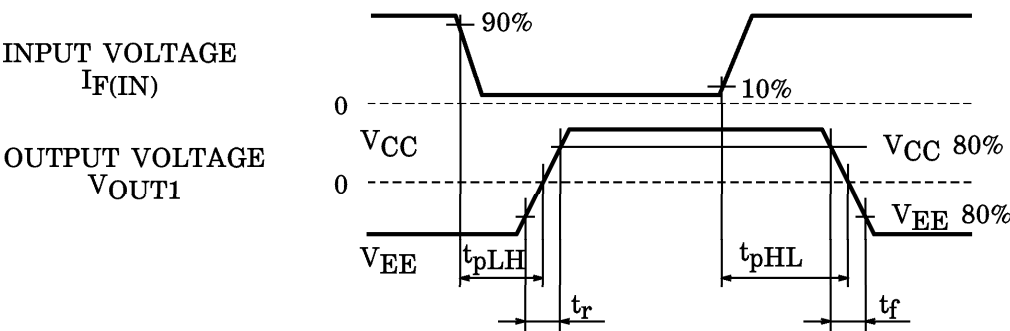


Fig.2 SWITCHING TIME TEST CONDITION

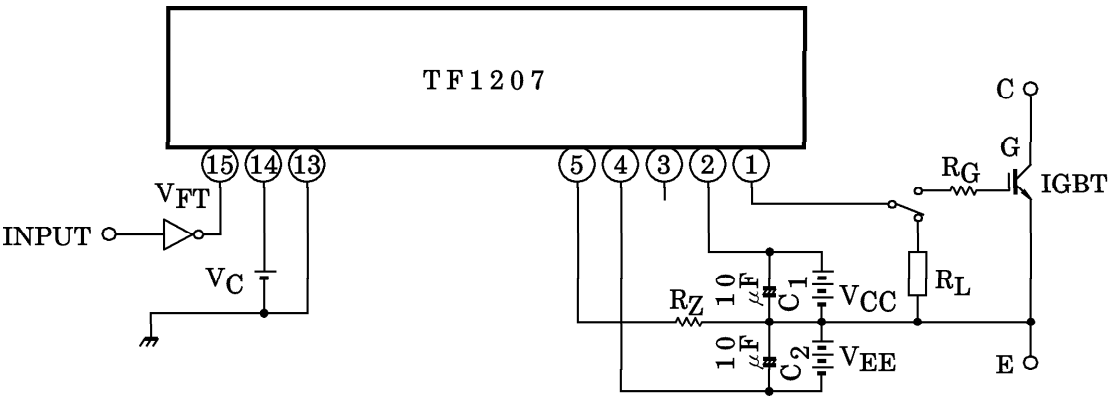
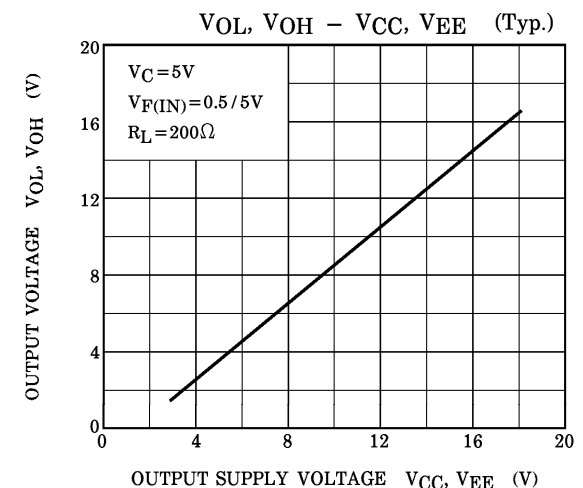
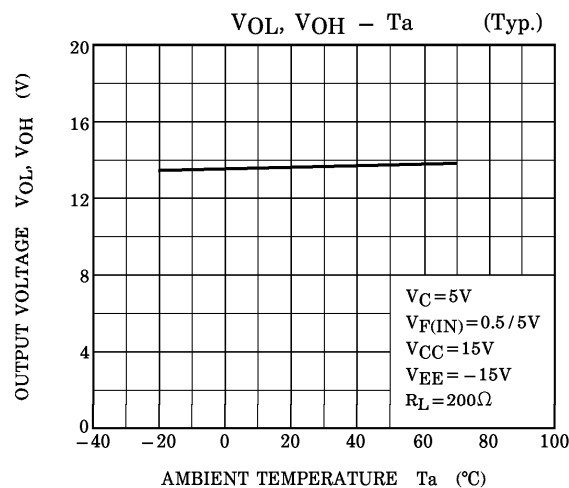
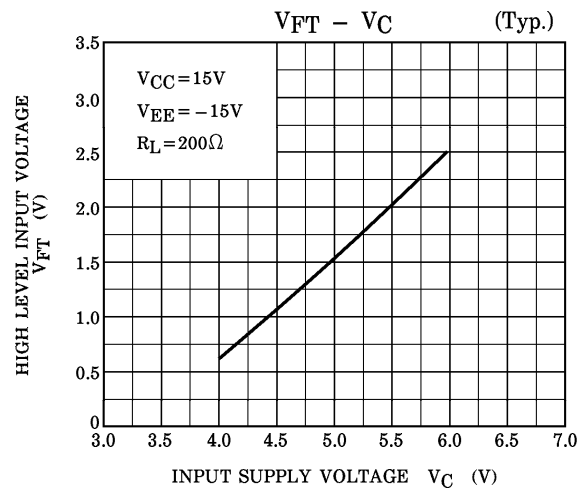
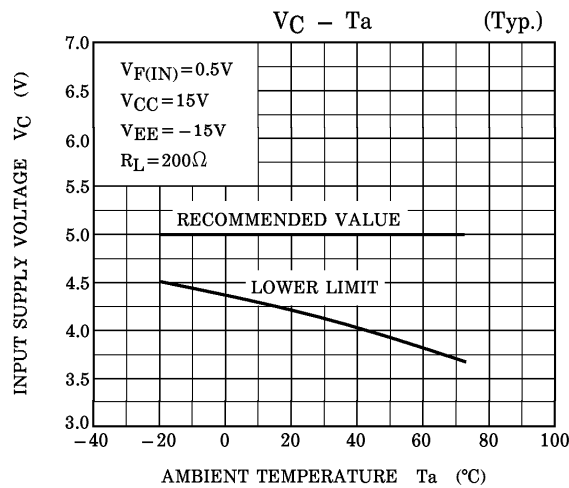
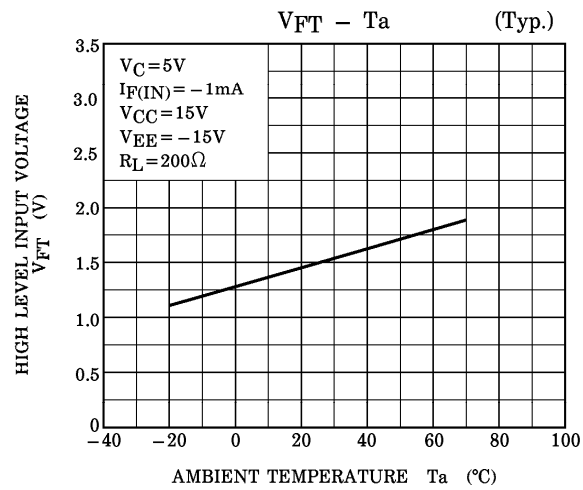
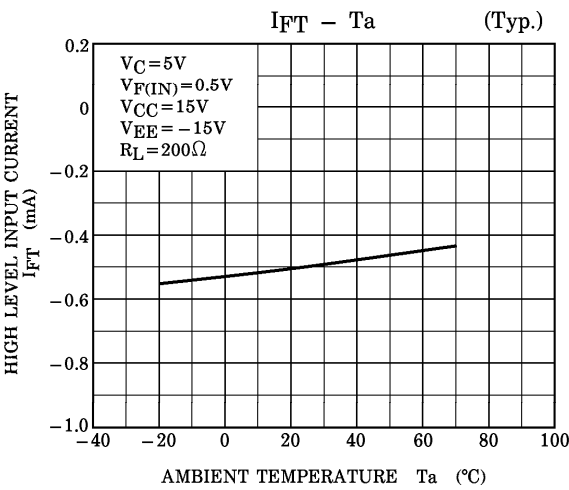
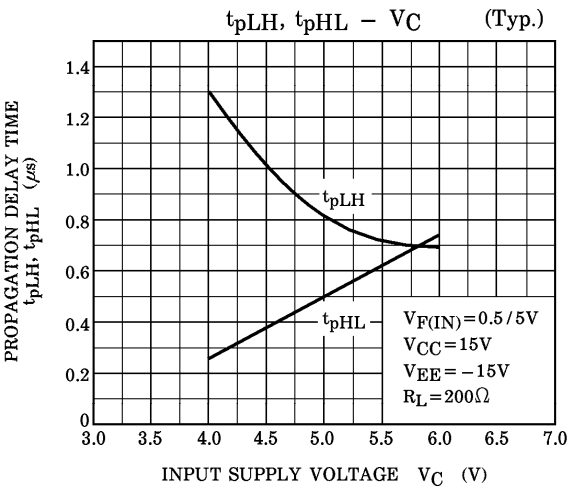
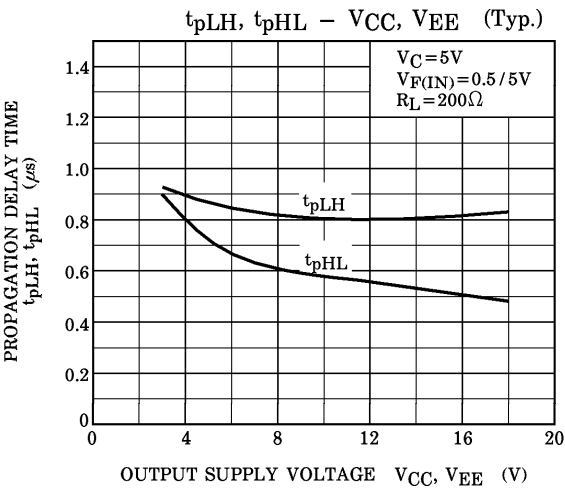
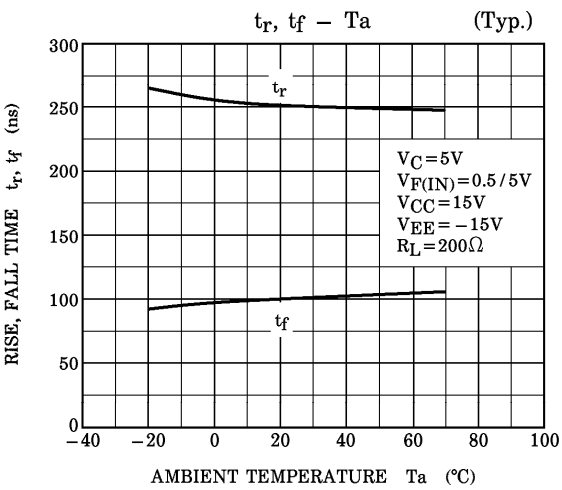
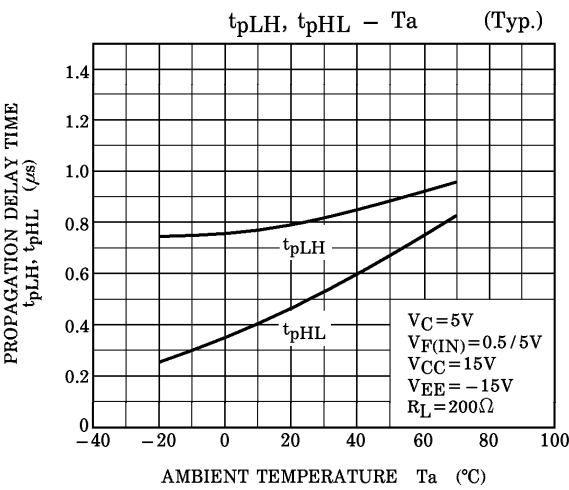


Fig.3 SWITCHING TIME TEST CIRCUIT





RESTRICTIONS ON PRODUCT USE

000707EBA

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.