

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62706P-H, TD62706FA-H

6ch HIGH-VOLTAGE SOURCE-CURRENT DRIVER

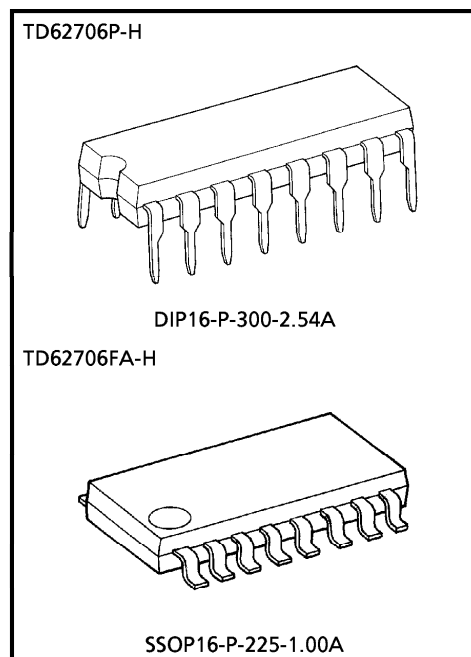
The TD62706P-H and TD62706FA-H are comprised of six source current Transistor Array.

This driver is specifically designed for fluorescent display applications.

For proper operation, the substrate (SUB) must be connected to the most negative voltage.

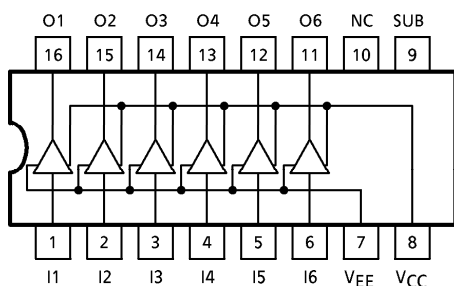
FEATURES

- Package Type
 - P-H Type : DIP16PIN
 - FA-H Type : SSOP16PIN
- High Output Voltage
 - : $V_{CC} - V_{OUT} = 60V$ (MIN)
- Output Current (Single Output)
 - : $I_{OUT} = -50mA$ (MAX)
- Input Compatible with Various Types of Logic
 - : $R_{IN} = 10k\Omega$
- Wide operating temperature range. : $T_{opr} = -40 \sim 105^{\circ}C$



Weight
 DIP16-P-300-2.54A : 1.11g (Typ.)
 SSOP16-P-225-1.00A : 0.14g (Typ.)

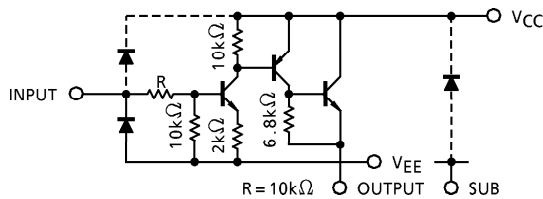
PIN ASSIGNMENT (Top view)



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SCHEMATICS (Each driver)



(Note) The input and output parasitic diodes cannot be used as clamp diodes.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Supply Voltage	$V_{CC}-V_{EE}$	30	V
	$V_{CC}-V_{SUB}$	60	
Output Voltage	$V_{CC}-V_{OUT}$	60	V
Input Voltage	$V_{IN}-V_{EE}$	$V_{CC}-V_{EE}$	V
Output Current	I_{OUT}	- 50	mA / ch
Input Current	I_{IN}	± 10	mA
Power Dissipation	P_D (Note 1)	1.0	W
	P_D (Note 2)	0.78	
Operating Temperature	T_{opr}	- 40~105	°C
Storage Temperature	T_{stg}	- 55~150	°C

(Note 1) TD62706P-H : Delated above 25°C in the proportion of 8.0mw / °C.

(Note 2) TD62706FA-H : On Glass Epoxy PCB (50. x 50 x 1.6mm Cu 40%).
Delated above 25°C in the proportion of 6.2mw / °C.

RECOMMENDED OPERATING CONDITIONS (Ta = - 40~85°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Power Supply Voltage	V_{CC}	$V_{EE} = 0V$	4.5	—	25	V
	V_{SUB}	$V_{CC} = 0V$	V_{OUT}	—	- 55	
Output Voltage	V_{OUT}	$V_{CC} = 0V$	0	—	- 55	V
Output Current	I_{OUT}	—	0	—	- 40	mA / ch
Input Voltage	V_{IN}	$V_{EE} = 0V, V_{CC} = 25V$	0	—	7	V
Power Dissipation	P_D	TD62706P-H	—	—	0.52	W
		TD62706FA-H when mounting	—	—	0.4	

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Input Voltage	"H" Level	V _{IH}	1	V _{EE} = 0V	2.2	—	—	V
	"L" Level	V _{IL}		V _{EE} = 0V	—	—	0.8	
Input Current	"H" Level	I _{IH}	2	V _{EE} = 0V, V _{IN} = 2.4V	—	0.12	0.18	mA
	"L" Level	I _{IL}		V _{EE} = V _{IN} = 0V, V _{CC} = 25V	—	—	± 1	
Output Leakage Current		I _{CEX}	3	V _{EE} = 0V, V _{CC} = 25V V _{IN} = V _{IL} MAX., V _{OUT} = -30V	—	—	-100	μA
Collector-Emitter Saturation Voltage		V _{CE (sat)}	4	V _{EE} = 0V, V _{CC} = V _{CC} MIN. V _{IN} = V _{IH} MIN., I _{OUT} = -40mA	—	—	V _{CC} -2.5	V
Supply Current (Output On)		I _{CC (ON)}	1	V _{EE} = 0V, V _{CC} = 25V V _{IN} = V _{IH} MAX., OUTPUT = OPEN	—	—	25	mA
Turn-On Delay		t _{ON}	5	R _L = 1.4kΩ C _L = 15pF	—	0.2	—	μs
Turn-Off Delay		t _{OFF}			—	1.5	—	

RECOMMENDED OPERATING CONDITION (Ta = -40~105°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Power Supply Voltage	V _{CC}	V _{EE} = 0V		4.5	—	25	V
	V _{SUB}	V _{CC} = 0V		V _{OUT}	—	-55	
Output Voltage	V _{OUT}	V _{CC} = 0V		0	—	-55	V
Output Current	I _{OUT}	2 Circuits Parallel ON	TD62706P-H	0	—	-40	mA / ch
			TD62706FA-H	0	—	-40	
		4 Circuits Parallel ON	TD62706P-H	0	—	-37	
			TD62706FA-H	0	—	-30	
		6 Circuits Parallel ON	TD62706P-H	0	—	-15	
			TD62706FA-H	0	—	-25	
Input Voltage	V _{IN}	V _{EE} = 0V, V _{CC} = 25V		0	—	7	V
Power Dissipation	P _D	TD62706P-H		—	—	0.36	W
		TD62706FA-H when mounting		—	—	0.28	

ELECTRICAL CHARACTERISTICS (Ta = 105°C) : TD62706P-H

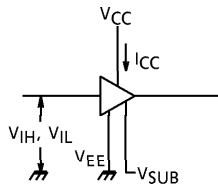
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Input Voltage	"H" Level	V_{IH}	1	$V_{EE} = 0V$	1.8	—	—	V
	"L" Level	V_{IL}		$V_{EE} = 0V$	—	—	0.6	
Input Current	"H" Level	I_{IH}	2	$V_{EE} = 0V, V_{IN} = 2.4V$	—	0.12	0.18	mA
	"L" Level	I_{IL}		$V_{EE} = V_{IN} = 0V, V_{CC} = 25V$	—	—	± 10	
Output Leakage Current		I_{CEX}	3	$V_{EE} = 0V, V_{CC} = 25V$ $V_{IN} = V_{IL} \text{ MAX.}, V_{OUT} = -30V$	—	—	-300	μA
Collector-Emitter Saturation Voltage		$V_{CE} \text{ (sat)}$	4	$V_{EE} = 0V, V_{CC} = V_{CC} \text{ MIN.}$ $V_{IN} = V_{IH} \text{ MIN.}, I_{OUT} = -40mA$	—	—	$V_{CC} - 2.5$	V
Supply Current (Output On)		$I_{CC} \text{ (ON)}$	1	$V_{EE} = 0V, V_{CC} = 25V$ $V_{IN} = V_{IH} \text{ MAX.}, \text{OUTPUT} = \text{OPEN}$	—	—	25	mA
Turn-On Delay		t_{ON}	5	$R_L = 1.4k\Omega, \text{Single circuit}$ $C_L = 15pF$	—	0.4	—	μs
Turn-Off Delay		t_{OFF}			—	3.0	—	

ELECTRICAL CHARACTERISTICS (Ta = 105°C) : TD62706FA-H

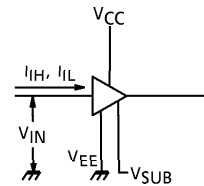
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Input Voltage	"H" Level	V_{IH}	1	$V_{EE} = 0V$	1.8	—	—	V
	"L" Level	V_{IL}		$V_{EE} = 0V$	—	—	0.6	
Input Current	"H" Level	I_{IH}	2	$V_{EE} = 0V, V_{IN} = 2.4V$	—	0.12	0.18	mA
	"L" Level	I_{IL}		$V_{EE} = V_{IN} = 0V, V_{CC} = 25V$	—	—	± 10	
Output Leakage Current		I_{CEX}	3	$V_{EE} = 0V, V_{CC} = 25V$ $V_{IN} = V_{IL} \text{ MAX.}, V_{OUT} = -30V$	—	—	-300	μA
Collector-Emitter Saturation Voltage		$V_{CE} \text{ (sat)}$	4	$V_{EE} = V_{SUB} = 0V, V_{CC} = V_{CC} \text{ MIN.}$ $V_{IN} = V_{IH} \text{ MIN.}, I_{OUT} = -25mA$	—	—	$V_{CC} - 1.1$	V
Supply Current (Output On)		$I_{CC} \text{ (ON)}$	1	$V_{EE} = V_{SUB} = 0V, V_{CC} = 16V$ $V_{IN} = V_{IH} \text{ MAX.}, \text{OUTPUT} = \text{OPEN}$	—	—	10	mA
Turn-On Delay		t_{ON}	5	$R_L = 1.4k\Omega, \text{Single circuit}$ $C_L = 15pF$	—	0.4	—	μs
Turn-Off Delay		t_{OFF}			—	3.0	—	

TEST CIRCUIT

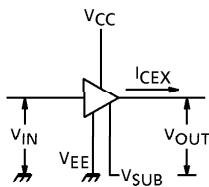
1. V_{IH} , V_{IL} , I_{CC}



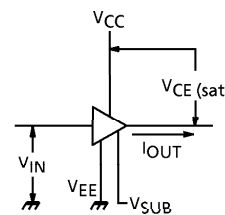
2. I_{IH} , I_{IL}



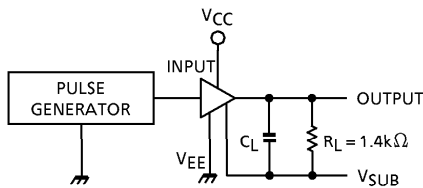
3. I_{CEX}



4. $V_{CE(sat)}$



5. t_{ON} , t_{OFF}



$C_L = 15\text{pF}$
(Includes probe and jig capacitance)

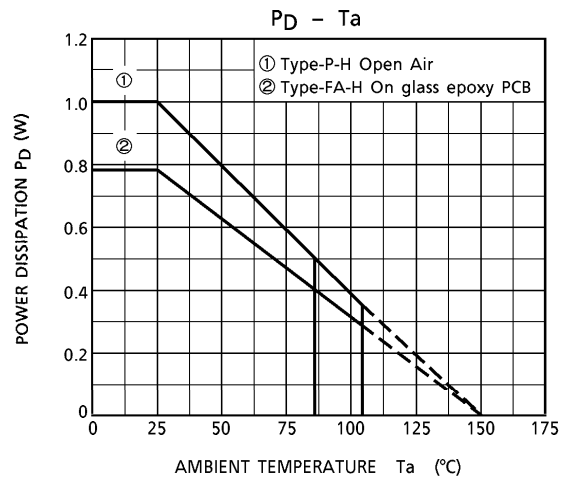
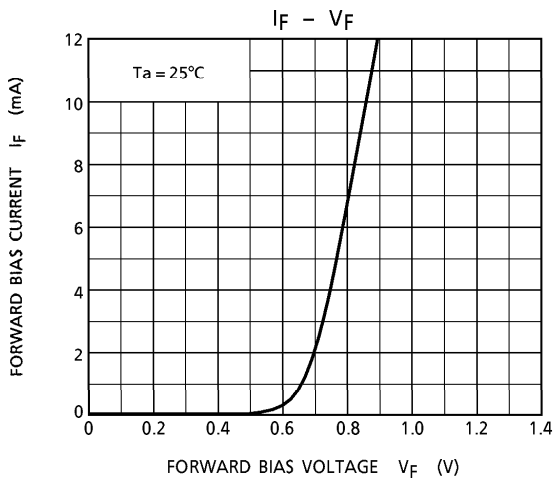
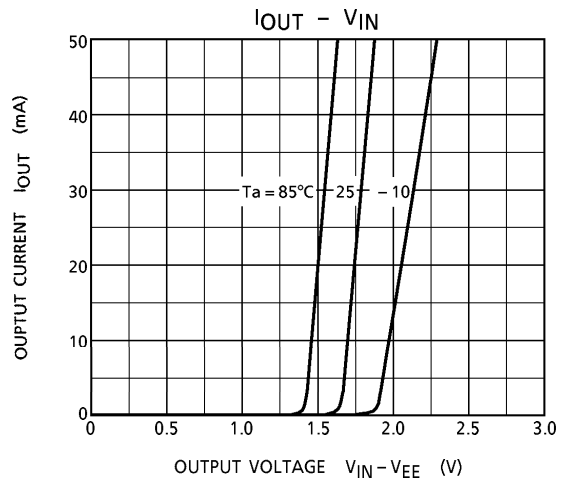
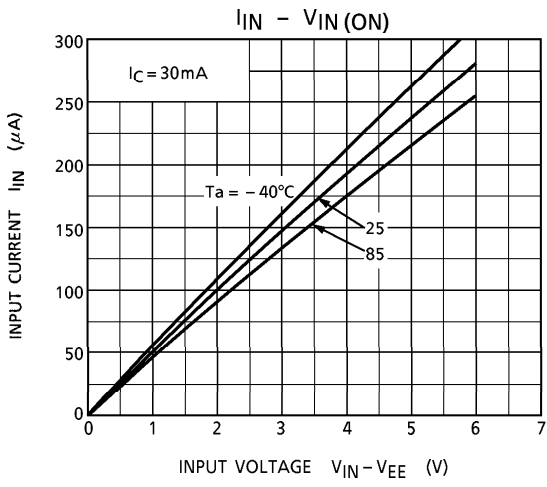
Input condition

	V_{IN}	V_{CC}	V_{SUB}
TD62706	0 - 3V	25V	- 30

V_{IN} : Pulse Width $50\mu\text{s}$
Duty Cycle 50%
 $t_r \leq 5\text{ns}$
 $t_f \leq 10\text{ns}$

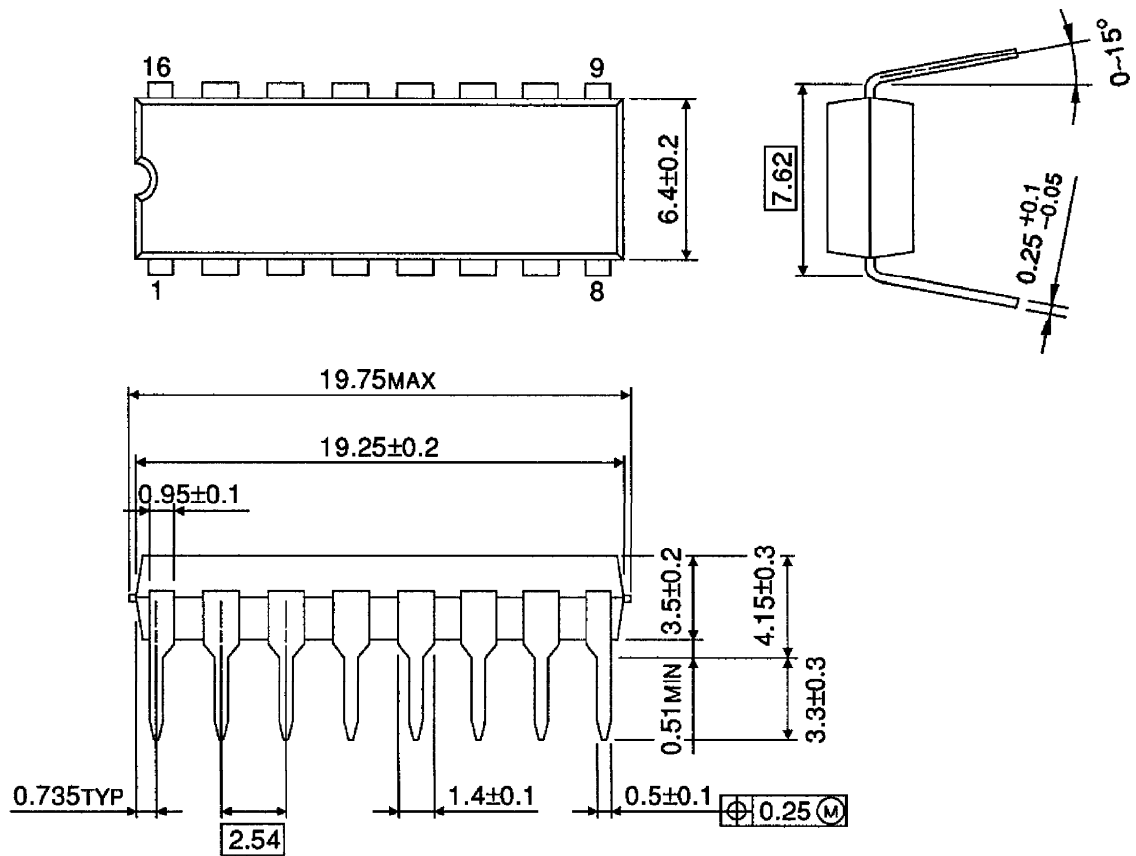
PRECAUTIONS for USING

Utmost care is necessary in the design of the output line, V_{CC} and GND (SUB, V_{EE}) line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



OUTLINE DRAWING
DIP16-P-300-2.54A

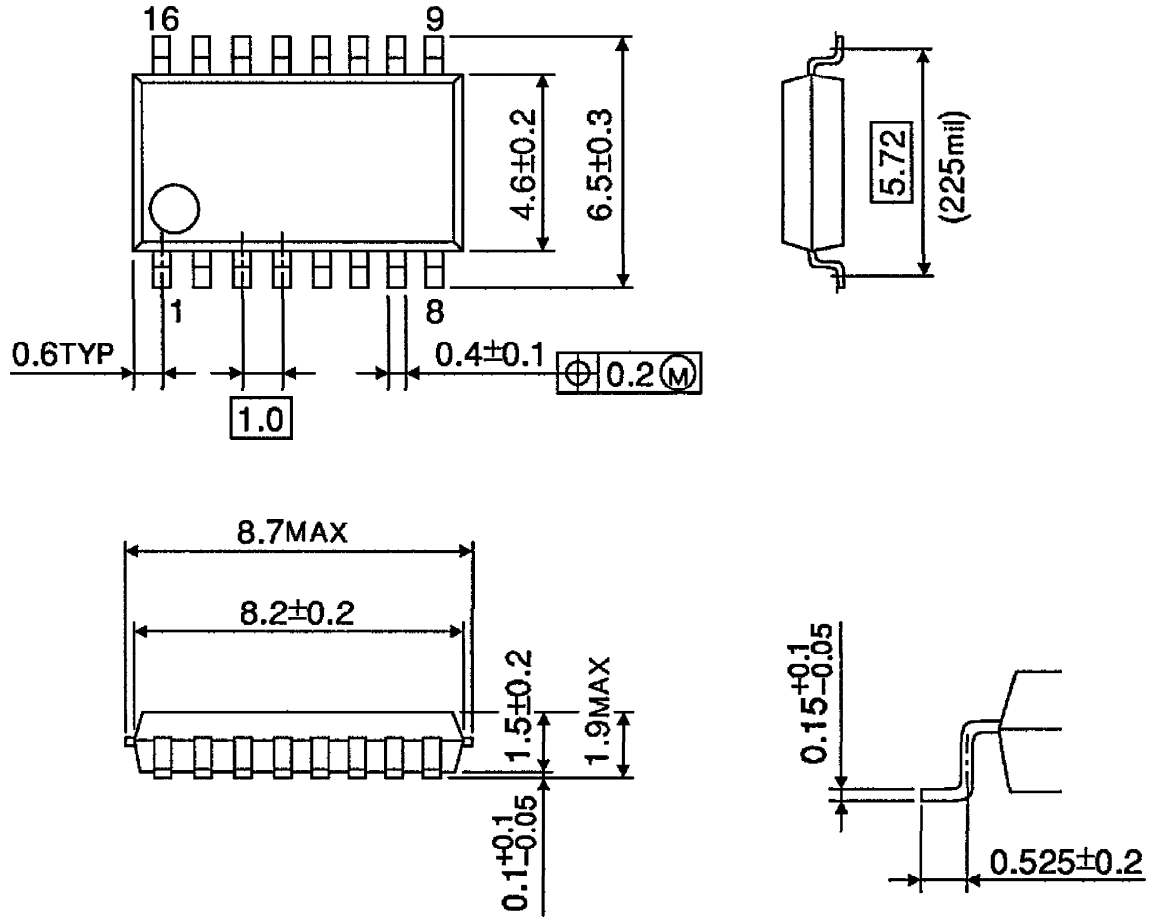
Unit : mm



Weight : 1.11g (Typ.)

OUTLINE DRAWING
SSOP16-P-225-1.00A

Unit : mm



Weight : 0.14g (Typ.)