

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

**TD62705P, TD62705F, TD62706P, TD62706F**

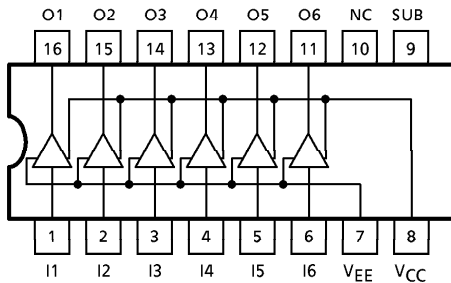
**6CH HIGH-VOLTAGE SOURCE DRIVER**

The TD62705P, TD62705F and TD62706P, TD62706F are comprised of six source current transistor array. These drivers are specifically designed for fluorescent display applications. For proper operation, the substrate (SUB) must be connected to the most negative voltage.

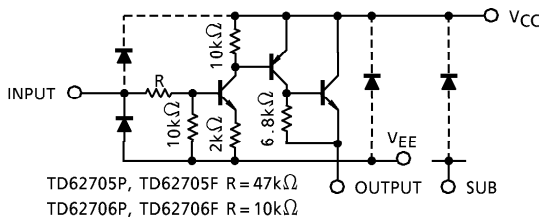
**FEATURES**

- High output voltage :  $V_{CC} - V_{OUT} = 60V$  (Min.)
- Output current (single output) :  $I_{OUT} = -50mA$  (Max.)
- Input compatible with various types of logic  
 TD62705P, TD62705F  $R_{IN} = 47k\Omega$  : 6~25V PMOS, CMOS  
 TD62706P, TD62706F  $R_{IN} = 10k\Omega$  : TTL, 5V CMOS
- Package type-P : DIP-16 pin
- Package type-F : SOP-16 pin

**PIN CONNECTION (TOP VIEW)**



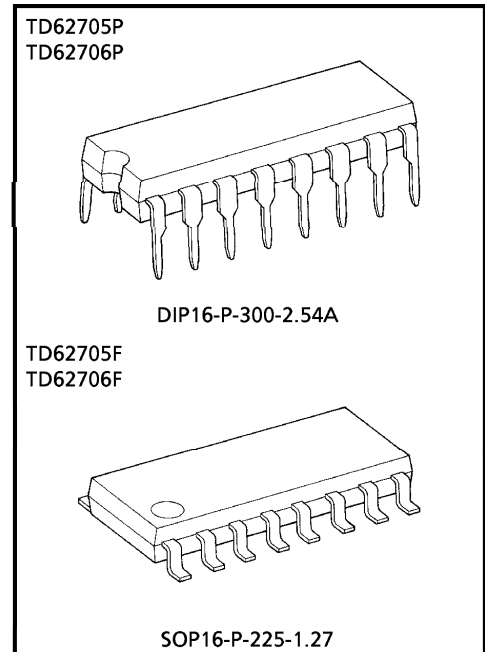
**SCHEMATICS (EACH DRIVER)**



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

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Weight  
 DIP16-P-300-2.54A : 1.11g (Typ.)  
 SOP16-P-225-1.27 : 0.16g (Typ.)

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT	
Supply Voltage	V <sub>CC-V<sub>EE</sub></sub>	30	V	
	V <sub>CC-V<sub>SUB</sub></sub>	60		
Output Voltage	V <sub>CC-V<sub>OUT</sub></sub>	- 60	V	
Input Voltage	V <sub>IN-V<sub>EE</sub></sub>	V <sub>CC - V<sub>EE</sub></sub>	V	
Output Current	I <sub>OUT</sub>	- 50	mA / ch	
Input Current	I <sub>IN</sub>	± 10	mA	
Power Dissipation	P F	P <sub>D</sub> (Note 2)	1.0	W
			0.625 (Note 1)	
Operating Temperature	T <sub>opr</sub>	- 40~85	°C	
Storage Temperature	T <sub>stg</sub>	- 55~150	°C	

(Note 1) On Glass Epoxy PCB (30×30×1.6mm Cu 50%)

(Note 2) Delated above 25°C in the proportion of 8.0mw/°C (P Type), 5.0mw/°C (F Type).

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

CHARACTERISTIC	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
Supply Voltage	TD62705P TD62705F	V <sub>CC</sub>	V <sub>EE</sub> = 0V	6.0	—	25	V
				4.5	—	25	
	TD62706P TD62706F	V <sub>SUB</sub>	V <sub>CC</sub> = 0V	V <sub>OUT</sub>	—	- 55	V
Output Voltage	V <sub>OUT</sub>	V <sub>CC</sub> = 0V	0	—	- 55	V	
Output Current	I <sub>OUT</sub>	—	0	—	- 40	mA / ch	
Input Voltage	TD62705P TD62705F	V <sub>IN</sub>	V <sub>EE</sub> = 0V, V <sub>CC</sub> = 25V	0	—	25	V
				0	—	7	
Power Dissipation	P	P <sub>D</sub>	—	—	0.36	W	
	F		On PCB (Note)	—	—		0.325

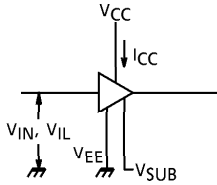
(Note) On Glass Epoxy PCB (30×30×1.6mm, Cu 50%)

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

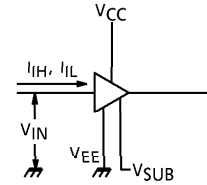
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Input Voltage	"H" Level	TD62705P	V <sub>IH</sub>	1	V <sub>EE</sub> = 0V	6.0	—	—	V
		TD62705F			V <sub>EE</sub> = 0V	2.2	—	—	
	"L" Level	TD62705P	V <sub>IL</sub>	1	V <sub>EE</sub> = 0V	—	—	2.2	
		TD62706P TD62706F			V <sub>EE</sub> = 0V	—	—	0.8	
Input Current	"H" Level	TD62705P	I <sub>IH</sub>	2	V <sub>EE</sub> = 0V, V <sub>IN</sub> = 6.0V	—	0.11	0.16	mA
		TD62705F			V <sub>EE</sub> = 0V, V <sub>IN</sub> = 2.4V	—	0.12	0.18	
	"L" Level	I <sub>IL</sub>	2	V <sub>EE</sub> = V <sub>IN</sub> = 0V, V <sub>CC</sub> = 25V	—	—	± 1	μA	
Output Leakage Current		I <sub>CEX</sub>	3	V <sub>EE</sub> = 0V, V <sub>CC</sub> = 25V V <sub>IN</sub> = V <sub>IL</sub> MAX. I <sub>OUT</sub> = - 30V	—	—	- 100	μA	
Collector-Emitter Saturation Voltage		V <sub>CE (sat)</sub>	4	V <sub>EE</sub> = 0V, V <sub>CC</sub> = V <sub>CC</sub> MIN. V <sub>IN</sub> = V <sub>IH</sub> MIN. I <sub>OUT</sub> = - 40mA	—	—	V <sub>CC</sub> - 2.5	V	
Supply Current (Output On)	TD62705P	I <sub>CC</sub>	1	V <sub>EE</sub> = 0V, V <sub>CC</sub> = 25V V <sub>IN</sub> = V <sub>IN</sub> MAX. I <sub>OUT</sub> = 0mA	—	—	32	mA	
	TD62706P TD62706F				—	—	25		
Turn-On Delay		t <sub>ON</sub>	5	R <sub>L</sub> = 1.4kΩ, C <sub>L</sub> = 15pF	—	0.2	—	μs	
Turn-Off Delay		t <sub>OFF</sub>			—	1.5	—	μs	

**TEST CIRCUIT**

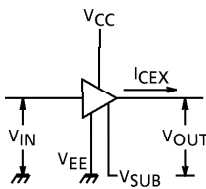
1.  $V_{IH}$ ,  $V_{IL}$ ,  $I_{CC}$



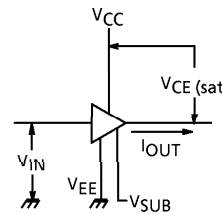
2.  $I_{IH}$ ,  $I_{IL}$



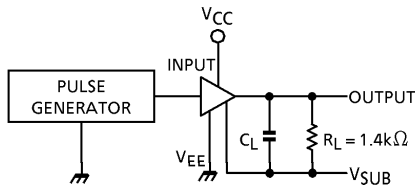
3.  $I_{CEX}$



4.  $V_{CE(sat)}$



5.  $t_{ON}$ ,  $t_{OFF}$



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

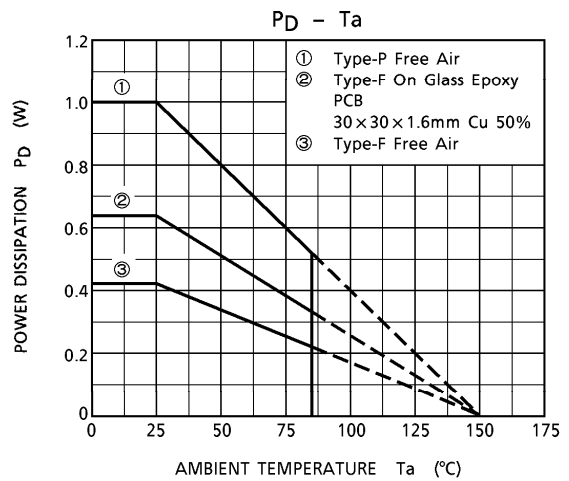
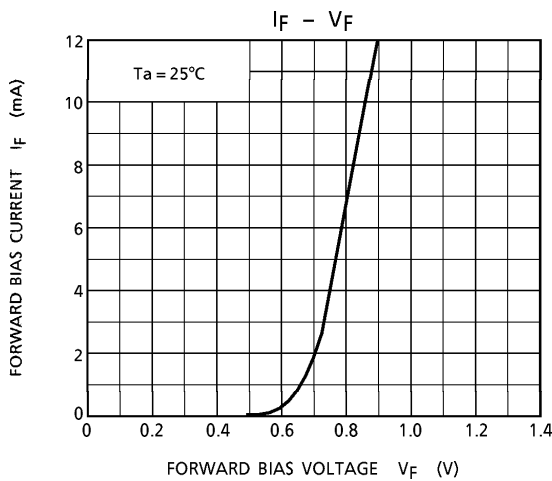
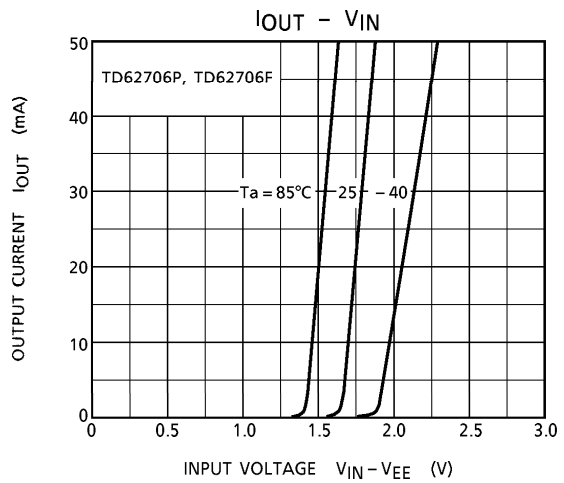
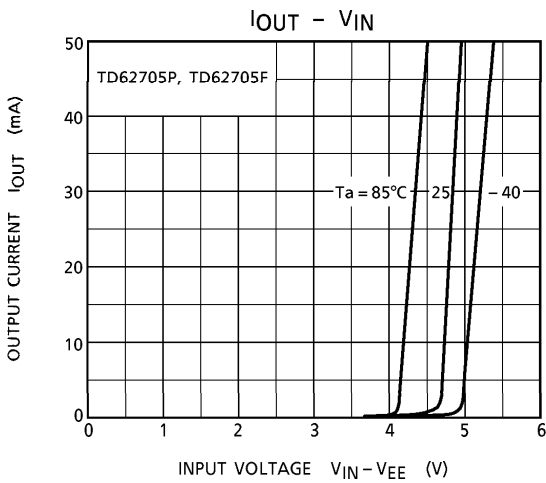
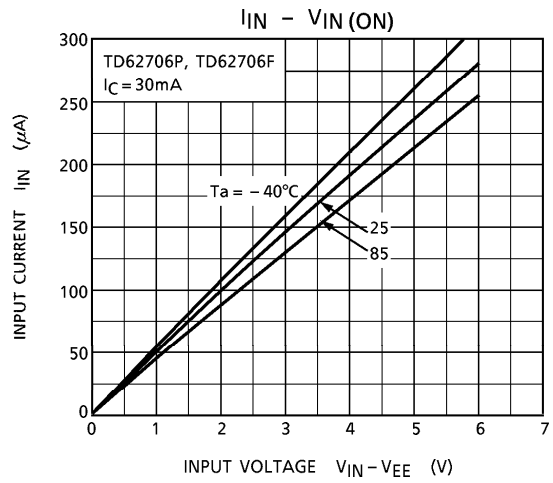
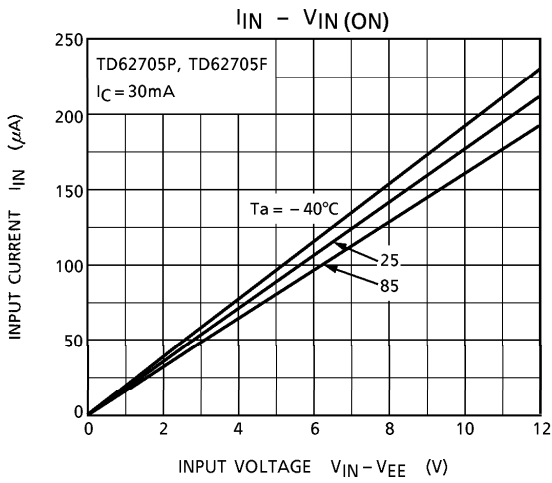
**INPUT CONDITION**

TYPE NAME	$V_{IN}$	$V_{CC}$	$V_{SUB}$
TD62705P, TD62705F	0-9V	25V	-30
TD62706P, TD62706F	0-3V	25V	-30

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

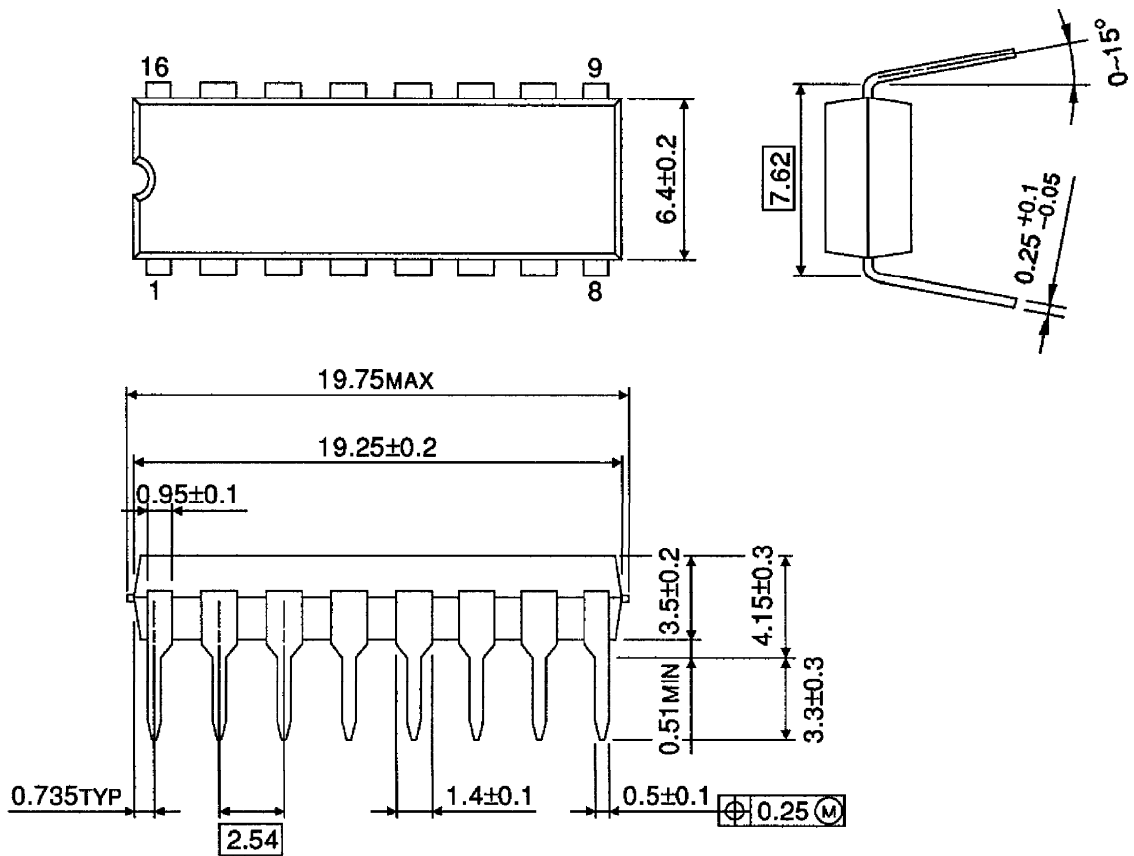
**PRECAUTIONS for USING**

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

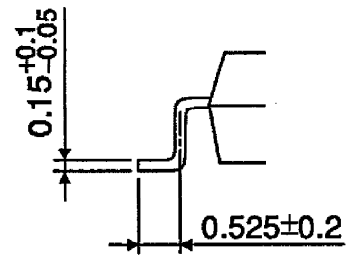
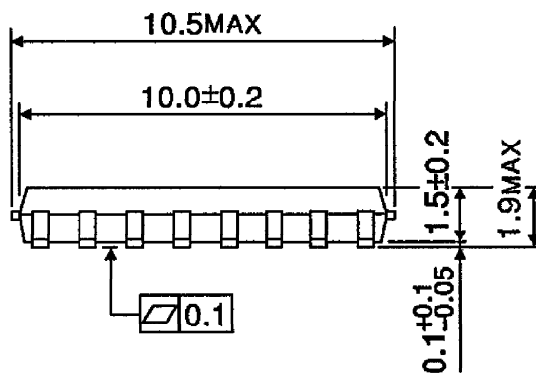
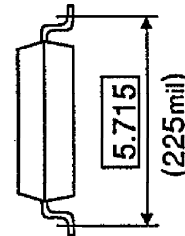
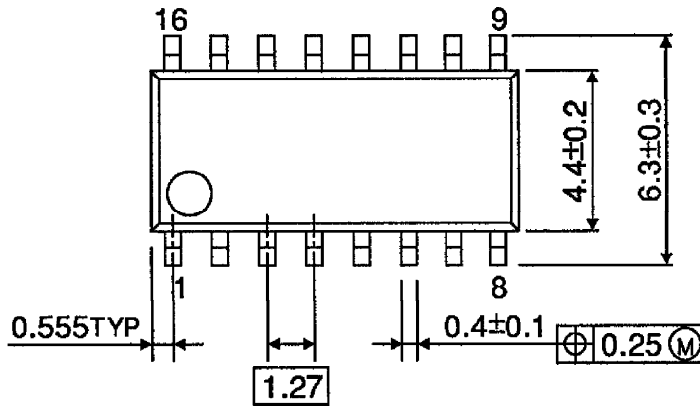
Unit : mm



Weight : 1.11g (Typ.)

**OUTLINE DRAWING**  
SOP16-P-225-1.27

Unit : mm



Weight : 0.16g (Typ.)