

TD62705PG, TD62705FG, TD62706PG, TD62706FG

6ch High-Voltage Source Driver

The TD62705PG, TD62705FG and TD62706PG, TD62706FG are comprised of six source current transistor array.

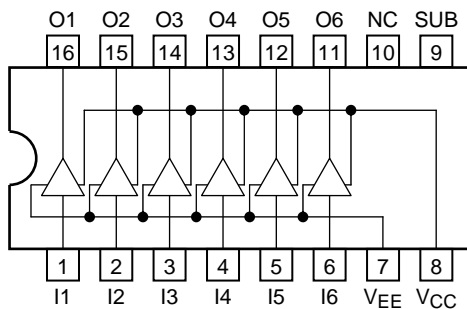
These drivers are specifically designed for fluorescent display applications.

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

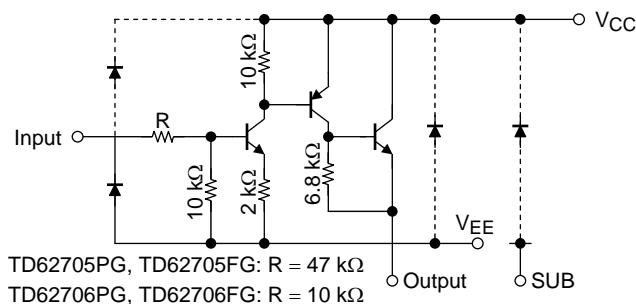
Features

- High output voltage: $V_{CC} - V_{OUT} = 60 \text{ V (min)}$
- Output current (single output): $I_{OUT} = -50 \text{ mA (max)}$
- Input compatible with various types of logic:
 TD62705PG, TD62705FG $R_{IN} = 47 \text{ k}\Omega$: 6 to 25 V PMOS, CMOS
 TD62706PG, TD62706FG $R_{IN} = 10 \text{ k}\Omega$: TTL, 5 V CMOS
- Package type-PG: DIP-16 pin
- Package type-FG: SOP-16 pin

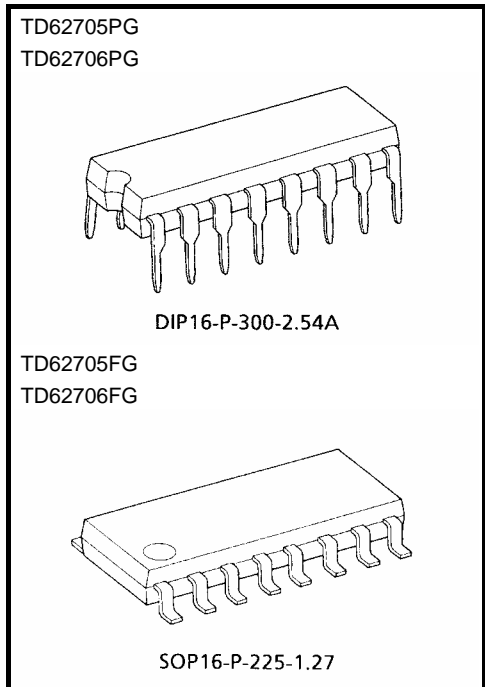
Pin Assignment (top view)



Schematics (each driver)



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



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

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
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	PG	P_D (Note 2)	1.0	W
	FG		0.625 (Note 1)	
Operating temperature		T_{opr}	-40 to 85	°C
Storage temperature		T_{stg}	-55 to 150	°C

Note 1: On glass epoxy PCB (30 × 30 × 1.6 mm Cu 50%)

Note 2: Delated above 25°C in the proportion 8.0 mw/°C (PG type), 5.0 mw/°C (FG type).

Recommended Operating Conditions (Ta = -40 to 85°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Supply voltage	TD62705PG TD62705FG	V_{CC}	$V_{EE} = 0 \text{ V}$	6.0	—	25	V
	TD62706PG TD62706FG			4.5	—	25	
		V_{SUB}	$V_{CC} = 0 \text{ V}$	V_{OUT}	—	-55	V
Output voltage		V_{OUT}	$V_{CC} = 0 \text{ V}$	0	—	-55	V
Output current		I_{OUT}	—	0	—	-40	mA/ch
Input voltage	TD62705PG TD62705FG	V_{IN}	$V_{EE} = 0 \text{ V}, V_{CC} = 25 \text{ V}$	0	—	25	V
	TD62706PG TD62706FG			0	—	7	
Power dissipation	PG	P_D	—	—	—	0.36	W
	FG		(Note 3)	—	—	0.325	

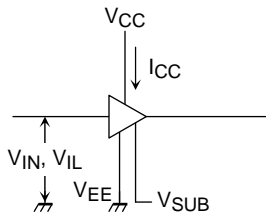
Note 3: On glass epoxy PCB (30 × 30 × 1.6 mm, Cu 50%)

Electrical Characteristics (Ta = 25°C)

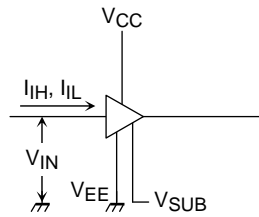
Characteristics			Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input voltage	High level	TD62705PG TD62705FG	V_{IH}	1	$V_{EE} = 0\text{ V}$	6.0	—	—	V
		TD62706PG TD62706FG			$V_{EE} = 0\text{ V}$	2.2	—	—	
	Low level	TD62705PG TD62705FG	V_{IL}	1	$V_{EE} = 0\text{ V}$	—	—	2.2	
		TD62706PG TD62706FG			$V_{EE} = 0\text{ V}$	—	—	0.8	
Input current	High level	TD62705PG TD62705FG	I_{IH}	2	$V_{EE} = 0\text{ V}, V_{IN} = 6.0\text{ V}$	—	0.11	0.16	mA
		TD62706PG TD62706FG			$V_{EE} = 0\text{ V}, V_{IN} = 2.4\text{ V}$	—	0.12	0.18	
	Low level		I_{IL}	2	$V_{EE} = V_{IN} = 0\text{ V},$ $V_{CC} = 25\text{ V}$	—	—	± 1	μA
Output leakage current			I_{CEX}	3	$V_{EE} = 0\text{ V}, V_{CC} = 25\text{ V},$ $V_{IN} = V_{IL\text{ max}}, I_{OUT} = -30\text{ V}$	—	—	-100	μA
Collector-emitter saturation voltage			$V_{CE\text{ (sat)}}$	4	$V_{EE} = 0\text{ V}, V_{CC} = V_{CC\text{ min}},$ $V_{IN} = V_{IH\text{ min}}, I_{OUT} = -40\text{ mA}$	—	—	$V_{CC} - 2.5$	V
Supply current (output on)		TD62705PG TD62705FG	I_{CC}	1	$V_{EE} = 0\text{ V}, V_{CC} = 25\text{ V},$ $V_{IN} = V_{IN\text{ max}}, I_{OUT} = 0\text{ mA}$	—	—	32	mA
		TD62706PG TD62706FG				—	—	25	
Turn-on delay			t_{ON}	5	$R_L = 1.4\text{ k}\Omega, C_L = 15\text{ pF}$	—	0.2	—	μs
Turn-off delay			t_{OFF}	5		—	1.5	—	μs

Test Circuit

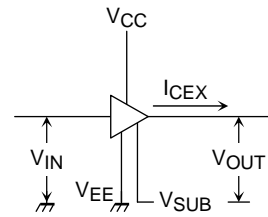
1. V_{IH} , V_{IL} , I_{CC}



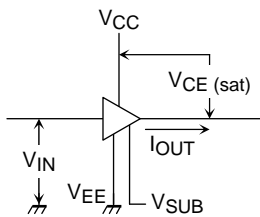
2. I_{IH} , I_{IL}



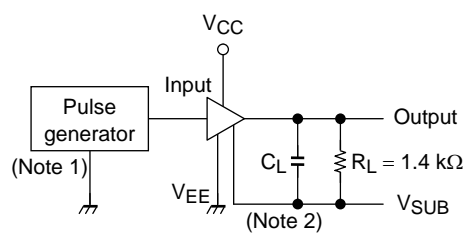
3. I_{CEX}



4. $V_{CE(sat)}$



5. t_{ON} , t_{OFF}



Note 1: Pulse Width 50 μ s, Duty Cycle 50%
Output Impedance 50 Ω , $t_r \leq 5$ ns, $t_f \leq 10$ ns

Note 2: $C_L = 15$ pF (includes probe and jig capacitance)

Input Condition

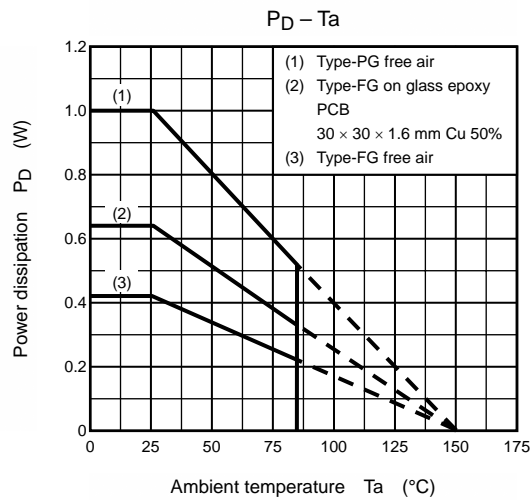
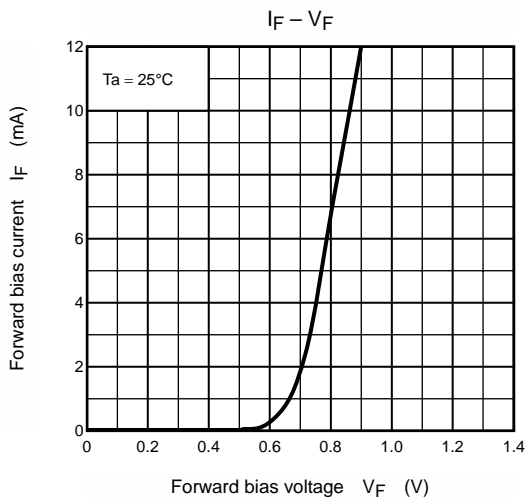
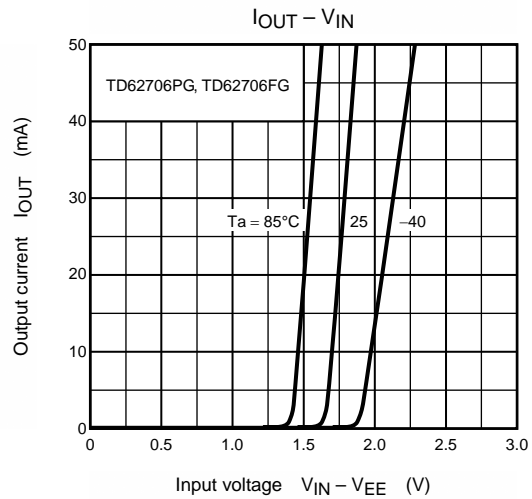
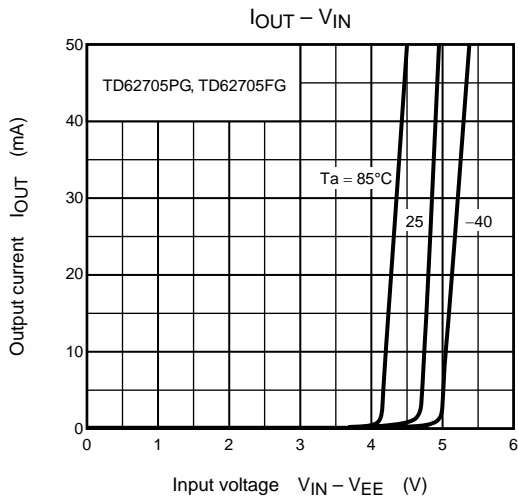
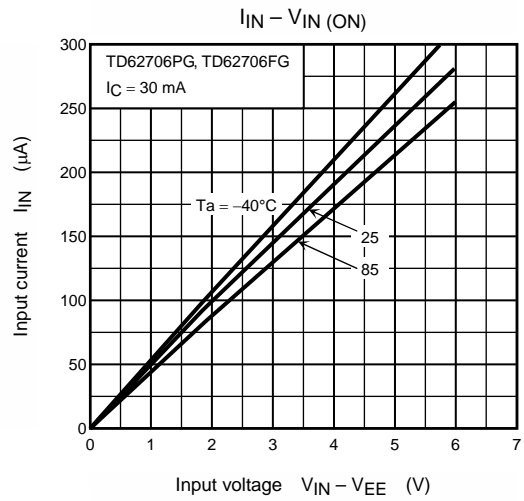
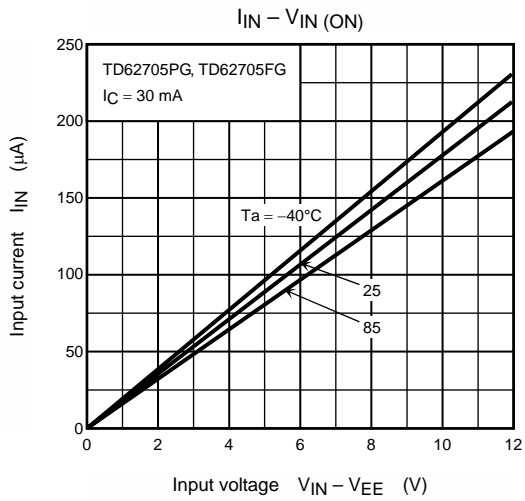
Type Number	V_{IN}	V_{CC}	V_{SUB}
TD62705PG, TD62705FG	0 to 9 V	25 V	-30
TD62706PG, TD62706FG	0 to 3 V	25 V	-30

Precautions for Using

This IC does not integrate protection circuits such as overcurrent and overvoltage protectors.

Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC.

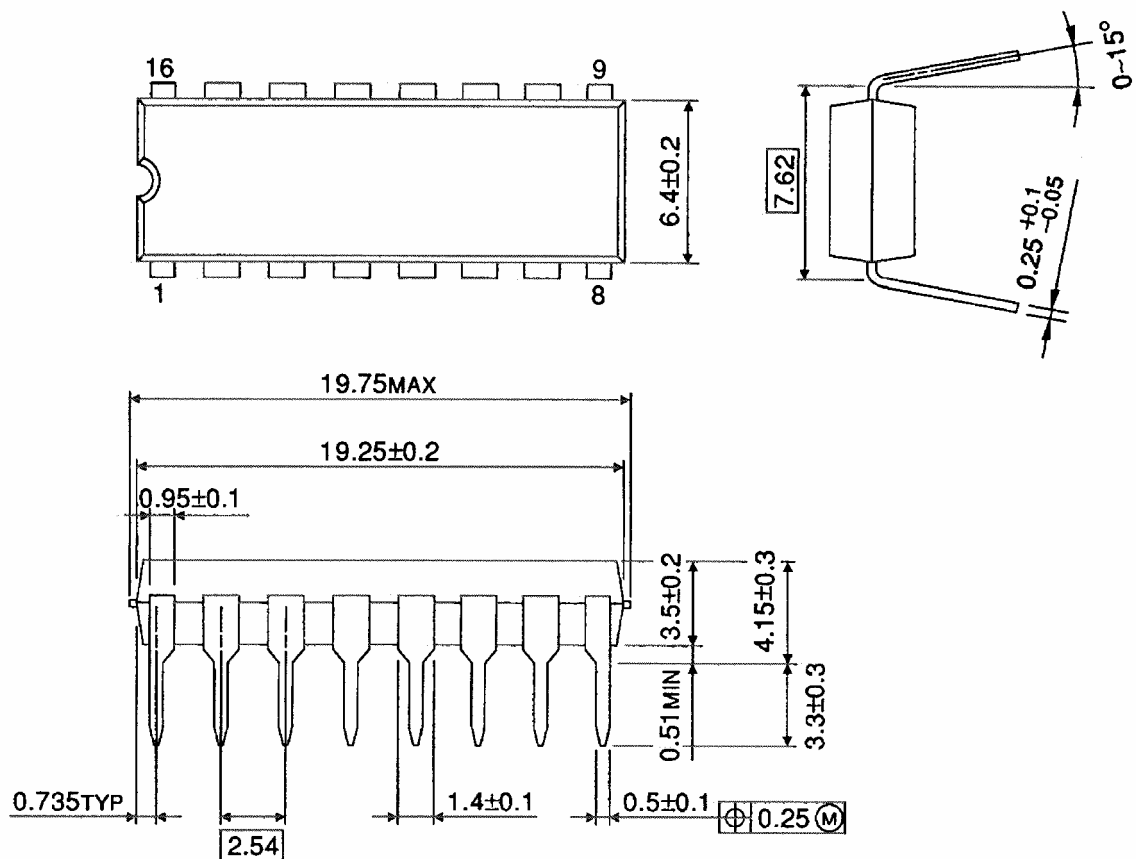
Utmost care is necessary in the design of the output line, V_{CC} and GND (SUB, V_{EE}) line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



Package Dimensions

DIP16-P-300-2.54A

Unit : mm

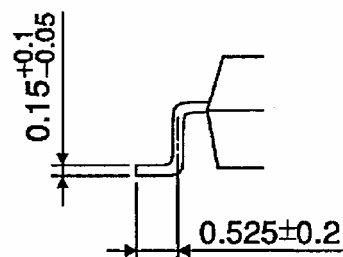
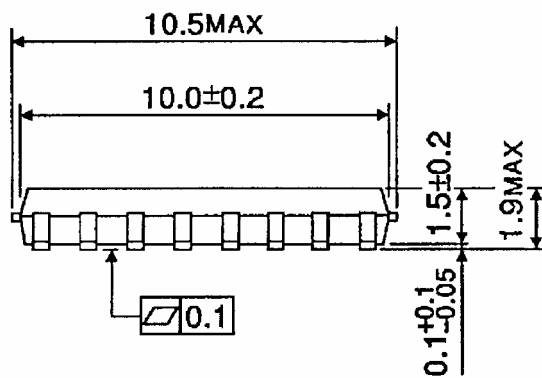
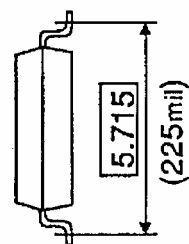
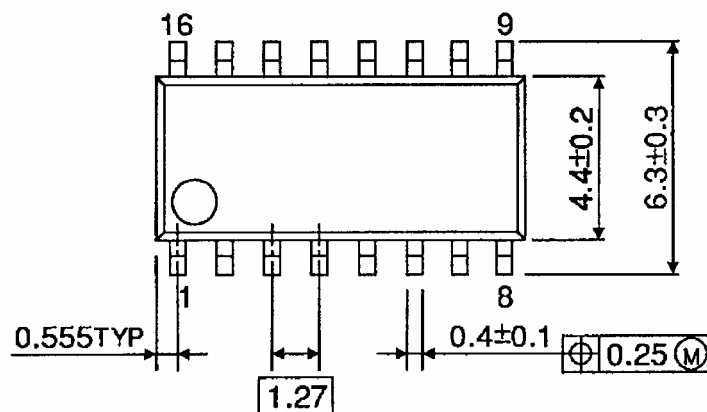


Weight: 1.11 g (typ.)

Package Dimensions

SOP16-P-225-1.27

Unit : mm



Weight: 0.16 g (typ.)

About solderability, following conditions were confirmed

- Solderability

Use of Sn-63Pb solder Bath

- solder bath temperature = 230°C
- dipping time = 5 seconds
- the number of times = once
- use of R-type flux

Use of Sn-3.0Ag-0.5Cu solder Bath

- solder bath temperature = 245°C
- dipping time = 5 seconds
- the number of times = once
- use of R-type flux

RESTRICTIONS ON PRODUCT USE

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