

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62101P, TD62101F, TD62103P, TD62103F
TD62104P, TD62104F, TD62105P, TD62105F

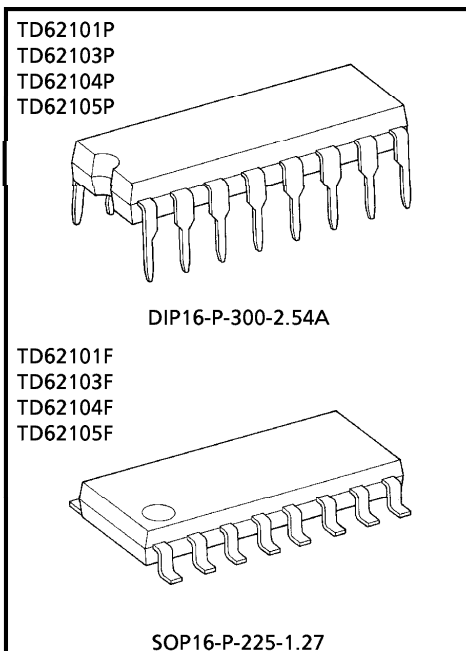
7CH DARLINGTON SINK DRIVER

The TD62101P/F series are high-voltage, high-current darlington drivers comprised of seven NPN darlington pairs.

FEATURES

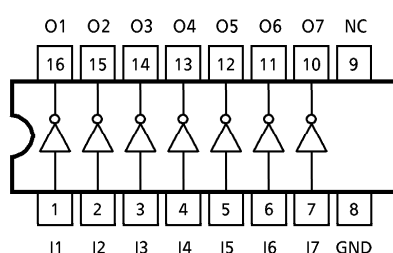
- Output current (single output) : 500mA (Max.)
- High sustaining voltage output : 25V (Min.)
- Inputs compatible with various types of logic.
- Package type-P : DIP-16 pin.
- Package type-F : SOP-16 pin.

TYPE	INPUT BASE RESISTOR	DESIGNATION
TD62101P/F	External	General Purpose
TD62103P/F	2.7k Ω	TTL, 5V CMOS
TD62104P/F	10.5k Ω	6~15V CMOS, PMOS
TD62105P/F	20k Ω	12~25V CMOS, PMOS



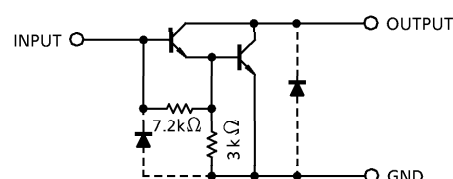
Weight
DIP16-P-300-2.54A : 1.11g (Typ.)
SOP16-P-225-1.27 : 0.16g (Typ.)

PIN CONNECTION (TOP VIEW)



SCHEMATICS (EACH DRIVER)

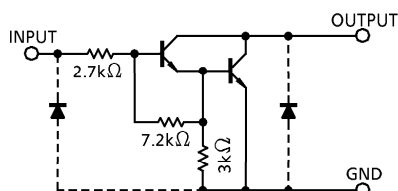
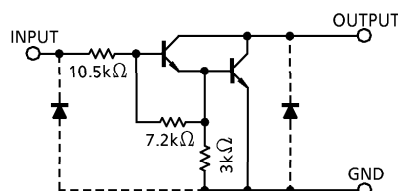
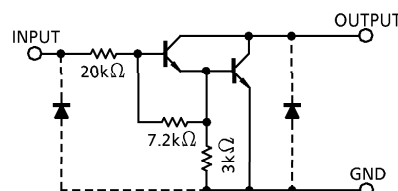
TD62101P/F



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

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SCHEMATICS (EACH DRIVER)
TD62103P / F

TD62104P / F

TD62105P / F


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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Output Sustaining Voltage		$V_{CE(SUS)}$	- 0.5 ~ 25	V
Output Current		I_{OUT}	500	mA / ch
Input Voltage		V_{IN} (Note 1)	- 0.5 ~ 30	V
Input Current		I_{IN} (Note 2)	25	mA
Power Dissipation	P	P_D	1.0	W
	F		0.625 (Note 3)	
Operating Temperature	P	T_{opr}	- 30 ~ 75	°C
	F		- 40 ~ 85	
Storage Temperature		T_{stg}	- 55 ~ 150	°C

(Note 1) Except TD62101P / F

(Note 2) Only TD62101P / F

(Note 3) On Glass Epoxy PCB (30 × 30 × 1.6mm Cu 50%)

RECOMMENDED OPERATING CONDITIONS (Ta = - 40 ~ 85°C and Ta = - 30 ~ 75°C for only Type-P)

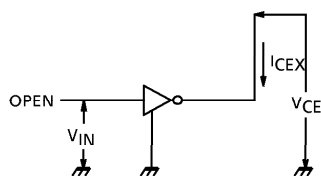
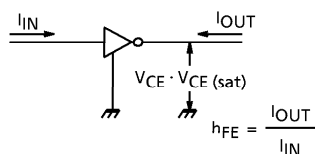
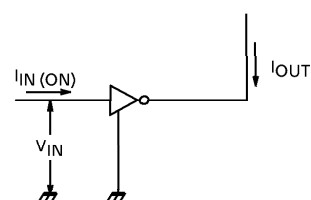
CHARACTERISTIC		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Output Sustaining Voltage		$V_{CE(SUS)}$		0	—	25	V
Output Current		I_{OUT}	DC 1 Circuit	0	—	350	mA / ch
			$T_{pw} = 25ms$, Duty = 10% 7 Circuits, Ta = 85°C, Tj = 120°C	0	—	300	
Input Voltage	Except TD62101P / F	V_{IN}		0	—	20	V
Input Current	Only TD62101P / F	I_{IN}		—	—	10	mA
Power Dissipation	P	P_D		—	—	0.44	W
	F		(Note)	—	—	0.325	

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

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

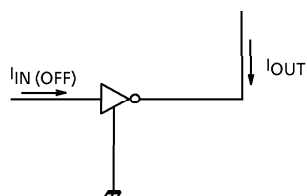
CHARACTERISTIC			SYMBOL	TEST CIR- CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Leakage Current		P	I _{CEX}	1	V _{CE} = 25V	Ta = 75°C	—	—	100	μA
		F			I _{IN} = 0	Ta = 85°C	—	—	100	
Collector-Emitter Saturation Voltage			V _{CE} (sat)	2	I _{OUT} = 350mA, I _{IN} = 600μA		—	1.3	2.2	V
					I _{OUT} = 200mA, I _{IN} = 400μA		—	1.1	2.0	
					I _{OUT} = 100mA, I _{IN} = 200μA		—	1.0	1.8	
DC Current Transfer Ratio			h _{FE}	2	V _{CE} = 2V, I _{OUT} = 350mA		1000	—	—	
Input Current	Output On	TD62101P / F	I _{IN} (ON)	3	V _{IN} = 1.5V, I _{OUT} = 350mA		—	0.25	—	mA
		V _{IN} = 1.75V, I _{OUT} = 350mA			—	1.00	—			
		V _{IN} = 2.4V, I _{OUT} = 350mA			—	0.4	0.7			
		V _{IN} = 13.5V, I _{OUT} = 350mA			—	1.2	1.7			
		V _{IN} = 20.0V, I _{OUT} = 350mA			—	1.0	1.5			
	Output Off	P	I _{IN} (OFF)	4	I _{OUT} = 500μA	Ta = 75°C	50	65	—	μA
		F				Ta = 85°C	50	65	—	
Input Voltage	Output On	TD62103P / F	V _{IN} (ON)	5	V _{CE} = 2V	I _{OUT} = 125mA	—	—	2.1	V
		TD62104P / F					—	—	4	
		TD62105P / F					—	—	6.4	
		TD62103P / F				I _{OUT} = 250mA	—	—	2.7	
		TD62104P / F					—	—	7	
		TD62105P / F					—	—	12	
		TD62103P / F				I _{OUT} = 350mA	—	—	3.3	
		TD62104P / F					—	—	8.8	
		TD62105P / F					—	—	15	
Input Capacitance			C _{IN}	6	V _{IN} = 0, f = 1MHz		—	15	—	pF
Turn-On Delay			t _{ON}	7	V _{OUT} = 25V, R _L = 70Ω		—	0.1	—	μs
Turn-Off Delay			t _{OFF}		C _L = 15pF		—	0.2	—	

TEST CIRCUIT

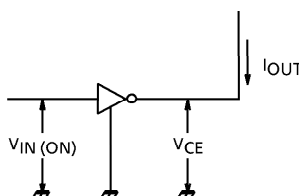
1. I_{CEX} 2. $h_{FE}, V_{CE(sat)}$ 3. $I_{IN(ON)}$ 

TEST CIRCUIT

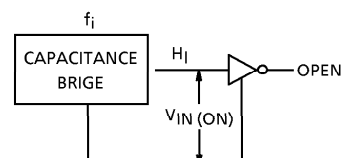
4. I_{IN} (OFF)



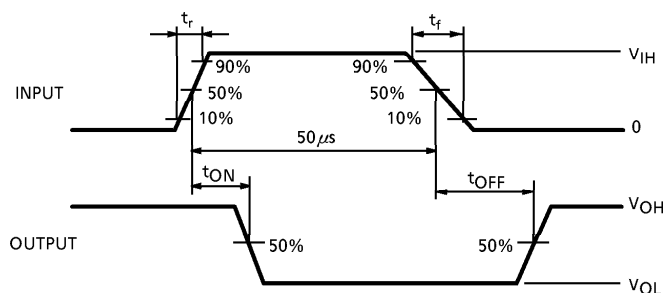
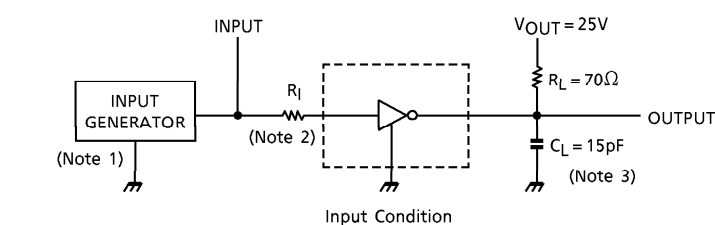
5. V_{IN} (ON)



6. C_{IN}



7. t_{ON} , t_{OFF}



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

(Note 2) See right.

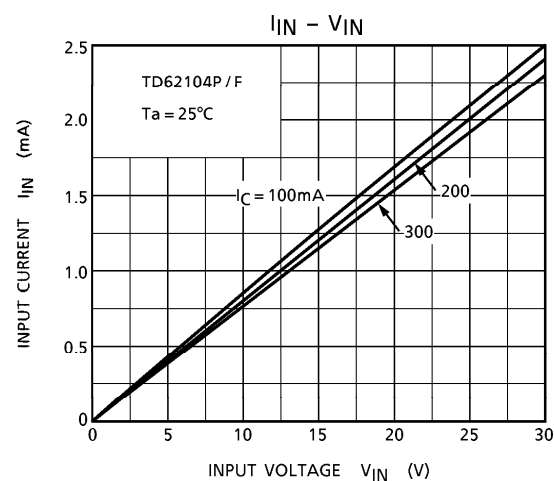
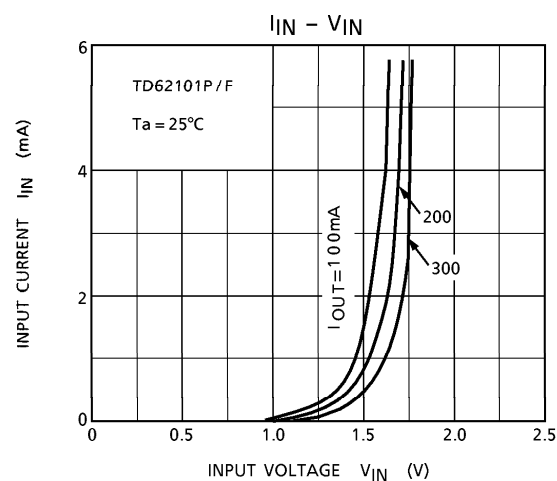
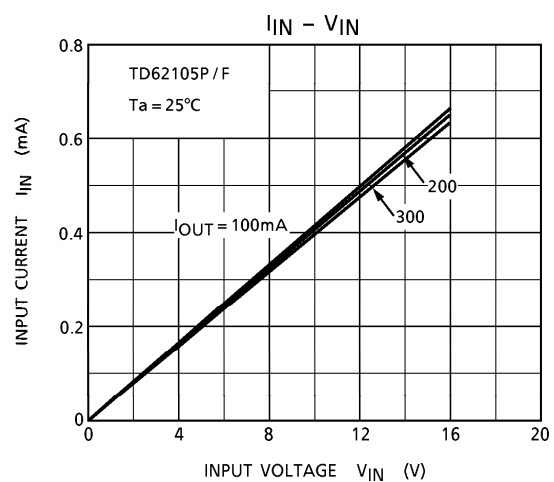
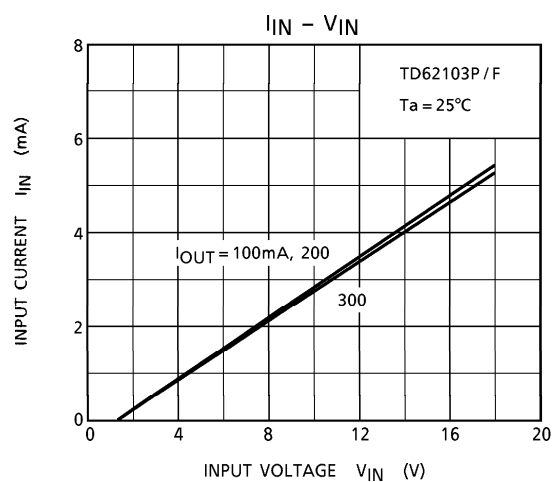
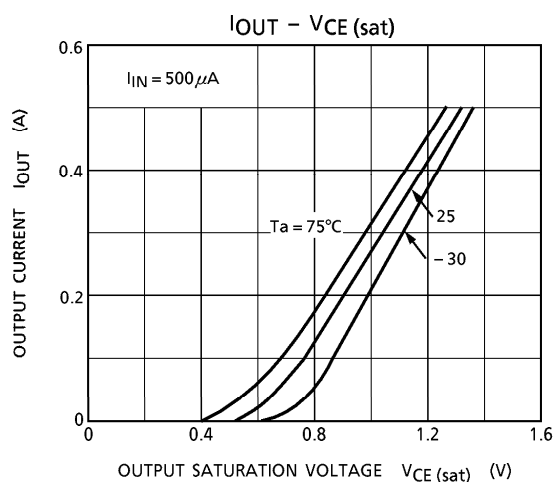
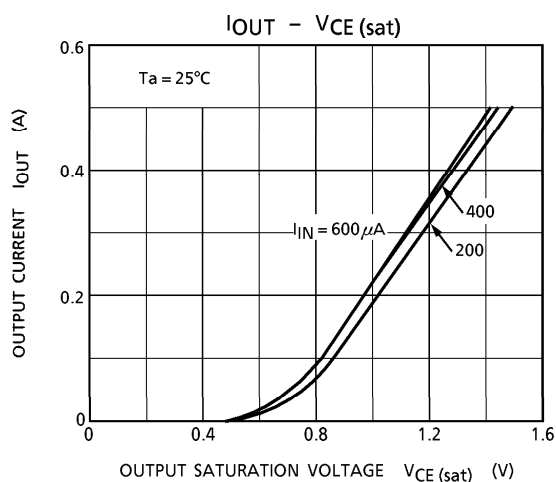
(Note 3) C_L includes probe and jig capacitance.

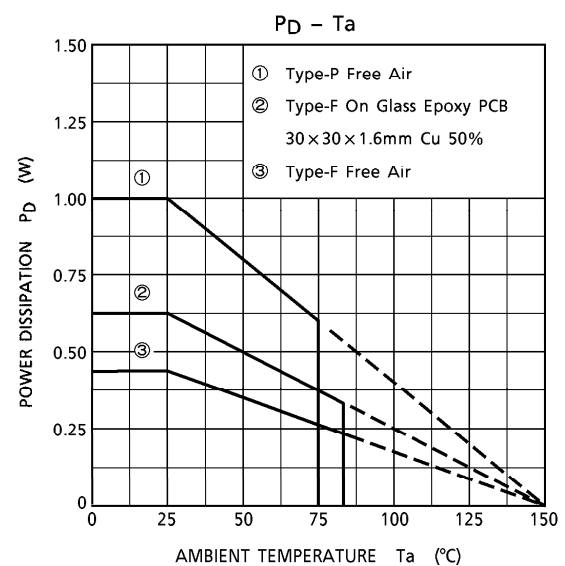
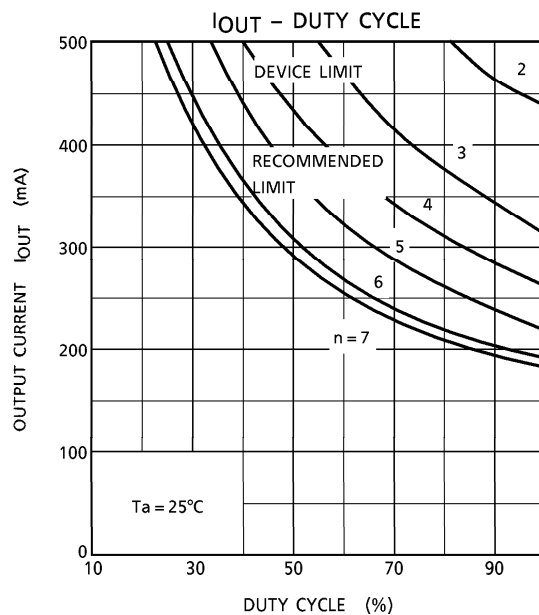
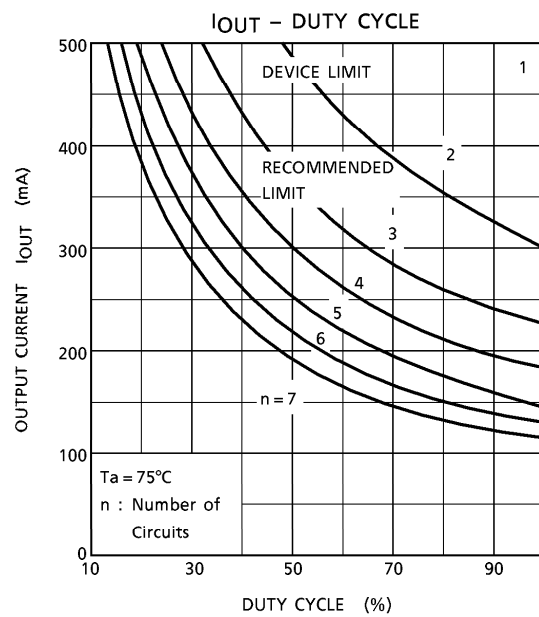
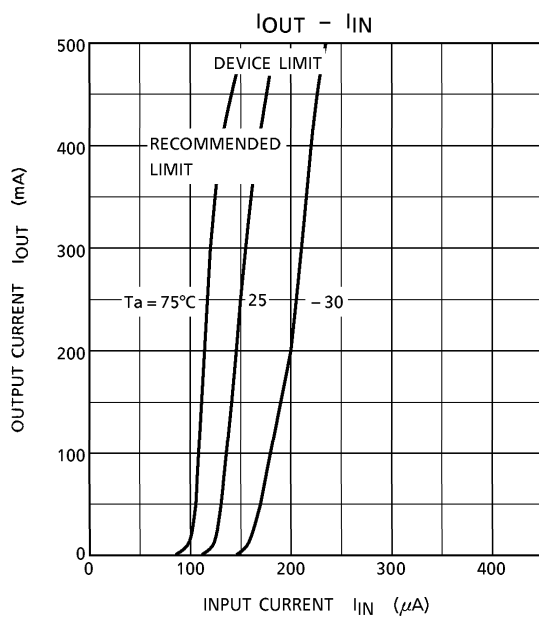
INPUT CONDITION

TYPE NUMBER	R_I	V_{IH}
TD62101P / F	$2.7k\Omega$	3V
TD62103P / F	0Ω	3V
TD62104P / F	0Ω	8V
TD62105P / F	0Ω	15V

PRECAUTIONS for USING

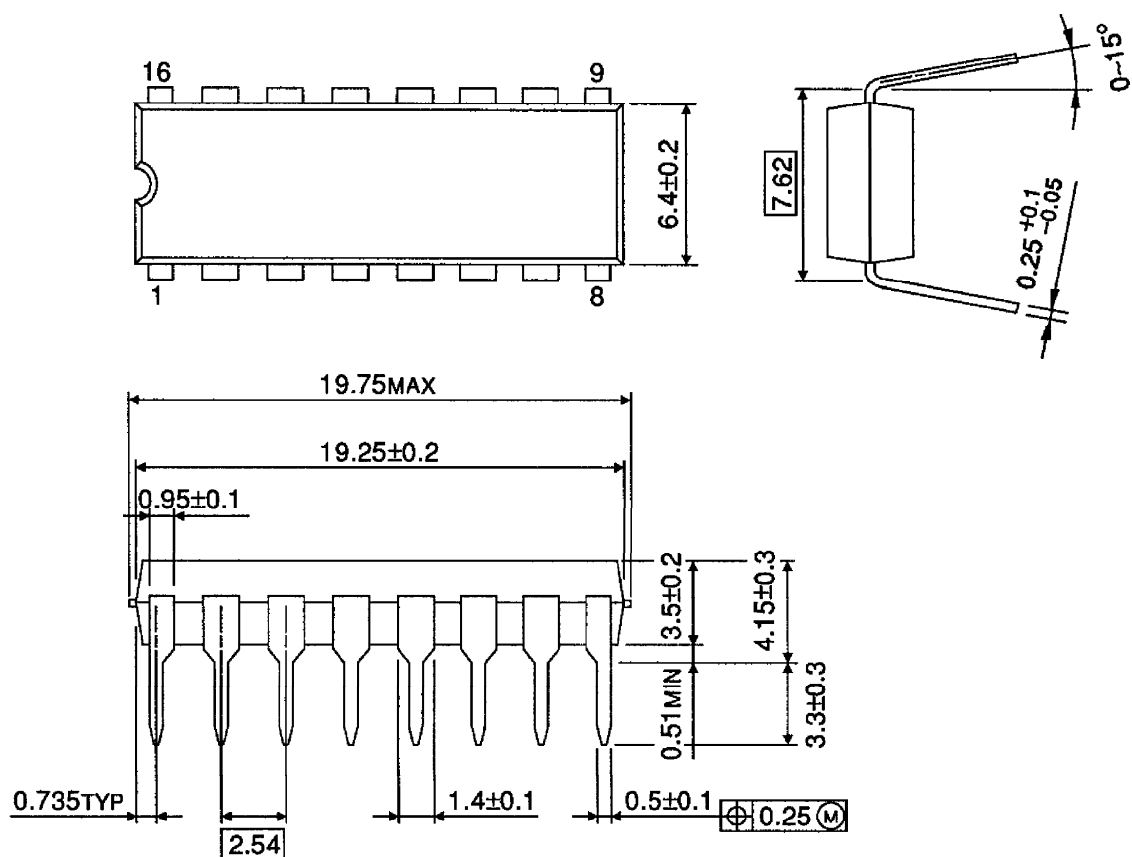
Utmost care is necessary in the design of the output line, GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.





OUTLINE DRAWING
DIP16-P-300-2.54A

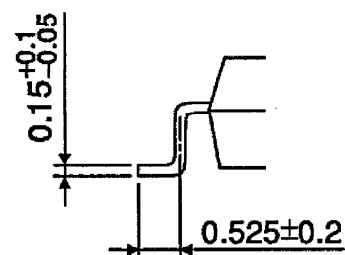
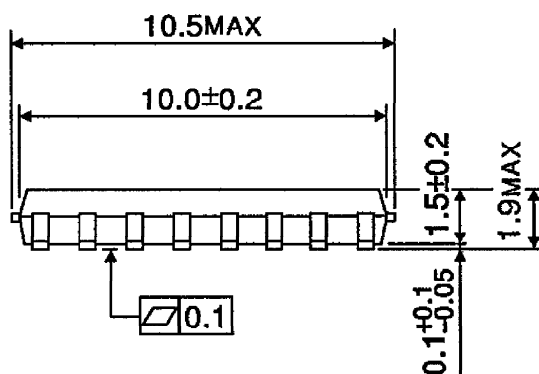
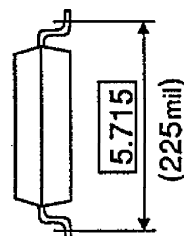
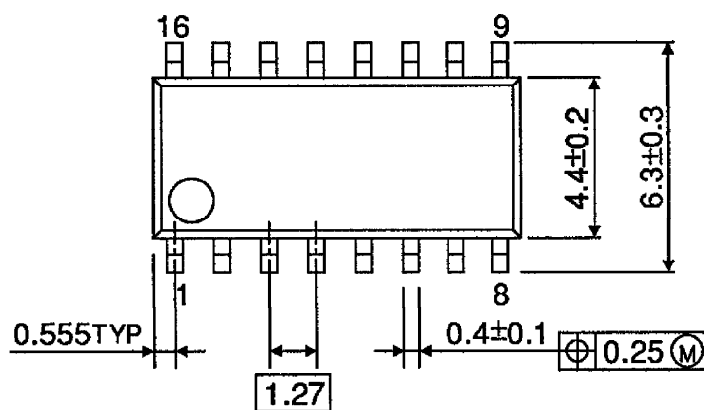
Unit : mm



Weight : 1.11g (Typ.)

OUTLINE DRAWING
SOP16-P-225-1.27

Unit : mm



Weight : 0.16g (Typ.)