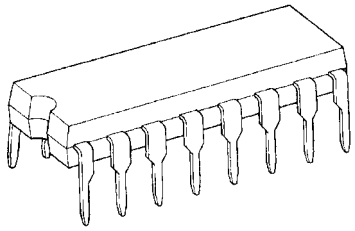
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62318AP,TD62318AF

4CH LOW INPUT ACTIVE HIGH−CURRENT DARLINGTON SINK DRIVER

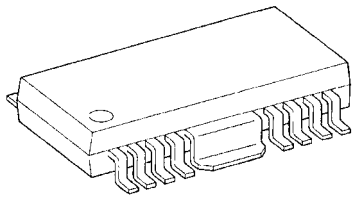
The TD62318AP and TD62318AF are non-inverting transistor arrays which are comprised of four NPN darlington output stages and PNP input stages.
These devices can be operated by source input voltage and are suitable for operation with a 5−V general pourposed logic IC such as TTL, 5−V CMOS and 5−V Microprocessor which have sink current output drivers.
Applications include relay, hammer, lamp and stepping moter drivers.
Please observe the thermal condition for using.

TD62318AP



DIP16-P-300-2.54A

TD62318AF



HSOP16-P-300-1.00

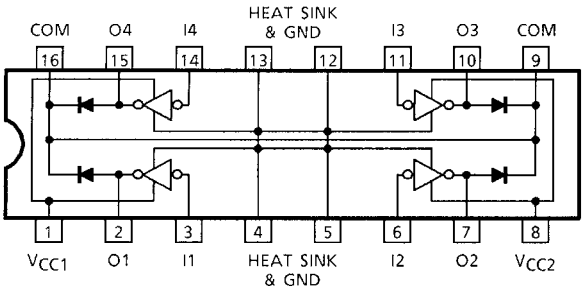
Weight
DIP16−P−300−2.54A : 1.11 g (Typ.)
HSOP16−P−300−1.00: 0.50 g (Typ.)

FEATURES

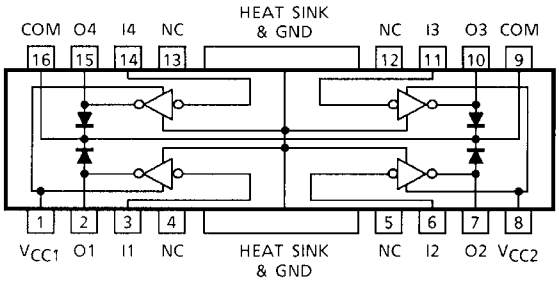
- Output current (single output) 700 mA (Max)
- High sustaining voltage output 50 V (Min)
- Output clamp diodes
- Input compatible with TTL and 5−V CMOS
- Low level active inputs
- Standard supply voltage
- Two V_{CC} terminals V_{CC1}, V_{CC2} (separated)
- GND and SUB terminal = heat sink
- Package type-AP: DIP-16 pin
- Package type-AF: HSOP-16 pin

PIN CONNECTION (TOP VIEW)

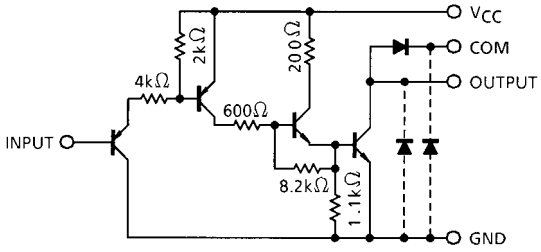
TD62318AP



TD62318AF



SCHEMATICS (EACH DRIVER)



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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTICS		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	−0.5~17	V
Output Sustaining Voltage		$V_{CE\ (SUS)}$	−0.5~50	V
Output Current		I_{OUT}	700	mA / ch
Input Current		I_{IN}	−10	mA
Input Voltage		V_{IN}	−0.5~30	V
Clamp Diode Reverse Voltage		V_R	50	V
Clamp Diode Forward Current		I_F	700	mA
Power Dissipation	AP	P_D	1.47 / 2.7 (Note 1)	W
	AF		0.9 / 1.4 (Note 2)	
Operating Temperature		T_{opr}	−40~85	°C
Storage Temperature		T_{stg}	−55~150	°C

Note 1: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 50%)
Note 2: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

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

CHARACTERISTIC		SYMBOL	CONDITION		MIN	TYP.	MAX	UNIT
Supply Voltage		V_{CC}			4.5	—	5.5	V
Output Sustaining Voltage		$V_{CE\ (SUS)}$			0	—	50	V
Output Current	AP	I_{OUT}	DC 1 circuit, Ta = 25 °C		0	—	570	mA / ch
			T_{pw} = 25ms 4 circuits Ta = 85°C T_j = 120°C	Duty = 10%	0	—	570	
				Duty = 50%	0	—	570	
	AF			Duty = 10%	0	—	570	
				Duty = 50%	0	—	480	
Input Voltage		V_{IN}			0	—	15	V
Input Voltage	Output On	$V_{IN\ (ON)}$			0	—	V_{CC} −3.6	V
	Output Off	$V_{IN\ (OFF)}$			V_{CC} −1.6	—	5.5	
Clamp Diode Reverse Voltage		V_R			—	—	50	V
Clamp Diode Forward Current		I_F			—	—	500	mA
Power Dissipation	AP	P_D	Ta = 85°C	(Note 1)	—	—	1.4	W
	AF		Ta = 85°C	(Note 2)	—	—	0.7	

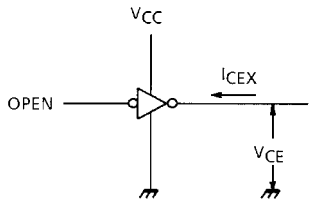
Note 1: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 50%)
Note 2: On Glass Epoxy PCB 60 × 30 × 1.6 mm Cu 30%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

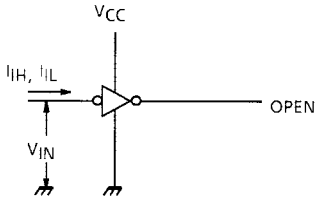
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Input Voltage	"H" Level	V_{IH}	—		V_{CC} −1.6	—	25	V
	"L" Level	V_{IL}			0	—	V_{CC} −3.6	
Input Current	"H" Level	I_{IH}	2		—	—	10	μA
	"L" Level	I_{IL}			—	−0.05	−0.36	mA
Output Leakage Current		I_{CEX}	1	V_{CE} = 50 V, Ta = 25°C	—	—	50	μA
				V_{CE} = 50 V, Ta = 85°C	—	—	100	
Output Saturation Voltage		$V_{CE\ (sat)}$	3	I_{OUT} = 0.5 A, V_{CC} = 4.5 V	—	—	0.8	V
				I_{OUT} = 0.2 A, V_{CC} = 4.5 V	—	—	0.45	
Clamp Diode Reverse Current		I_R	4	V_R = 50 V, Ta = 25°C	—	—	50	μA
				V_R = 50 V, Ta = 85°C	—	—	100	
Clamp Diode Forward Voltage		V_F	5	I_F = 500 mA	—	—	2.0	V
Supply Current	Output On	$I_{CC\ (ON)}$	2	V_{CC} = 5.5 V, V_{IN} = 0 V	—	35	40	mA / ch
	Output Off	$I_{CC\ (OFF)}$	2	V_{CC} = 5.5 V, V_{IN} = V_{CC}	—	—	10	μA
Turn−On Delay		t_{ON}	6	V_{OUT} = 50 V, R_L = 90 Ω V_{CC} = 5.0 V, C_L = 15 pF	—	0.4	0.8	μs
Turn−Off Delay		t_{OFF}			—	8.0	16.0	

TEST CIRCUIT

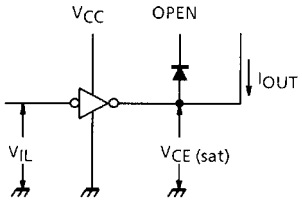
1. I_{CEX}



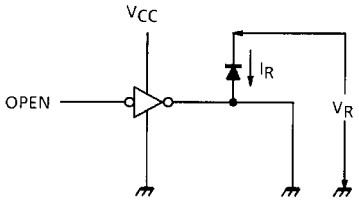
2. I_{IH}, I_{IL}



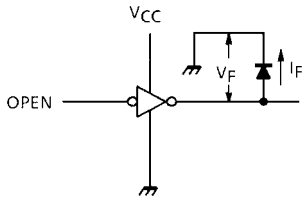
3. $V_{CE\ (sat)}$



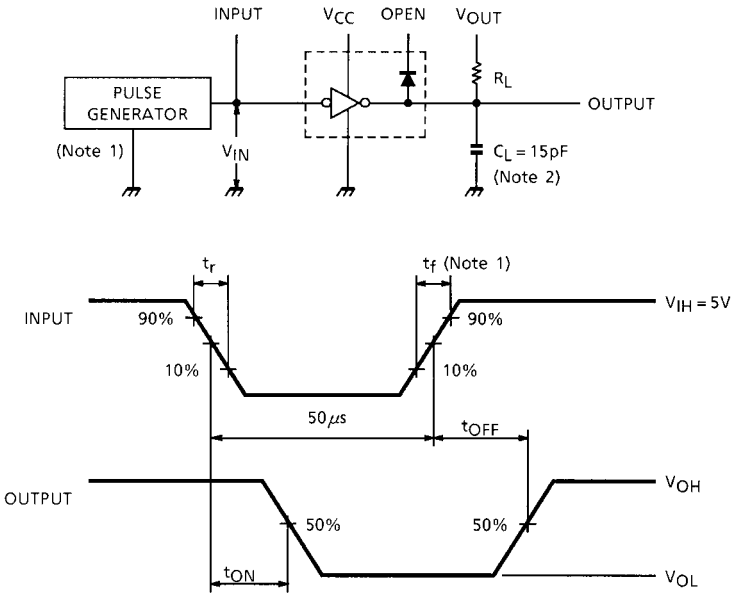
4. I_R



5. V_F



6. t_{ON}, t_{OFF}



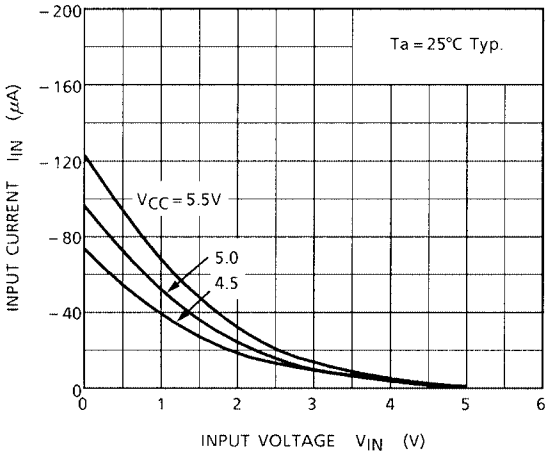
Note 1: Pulse Width 50 μs, duty cycle 10%
Output impedance 50 Ω, $t_r \leq 5$ ns, $t_f \leq 10$ ns

Note 2: C_L includes probe and jig capacitance.

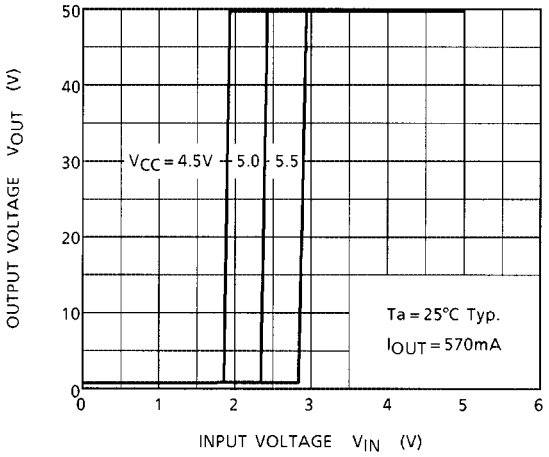
PRECAUTIONS for USING

This IC does not include built-in protection circuits for excess current or overvoltage.
If this IC is subjected to excess current or overvoltage, it may be destroyed.
Hence, the utmost care must be taken when systems which incorporate this IC are designed.
Utmost care is necessary in the design of the output line, V_{CC}, COMMON and GND line since IC may be destroyed due to short−circuit between outputs, air contamination fault, or fault by improper grounding.

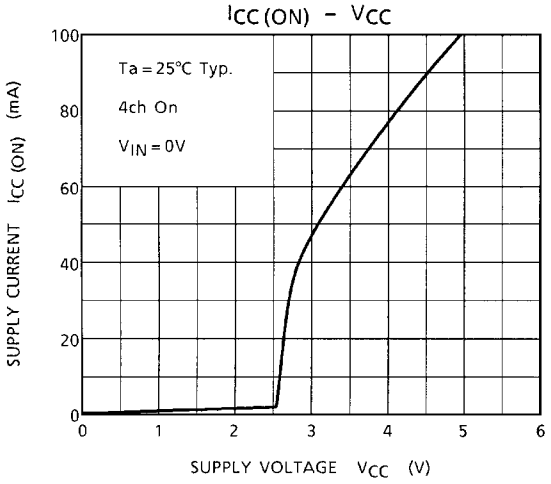
I_{IN} – V_{IN}



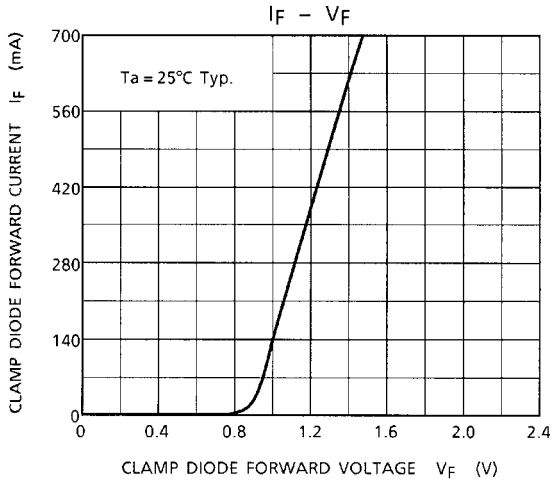
V_{OUT} – V_{IN}



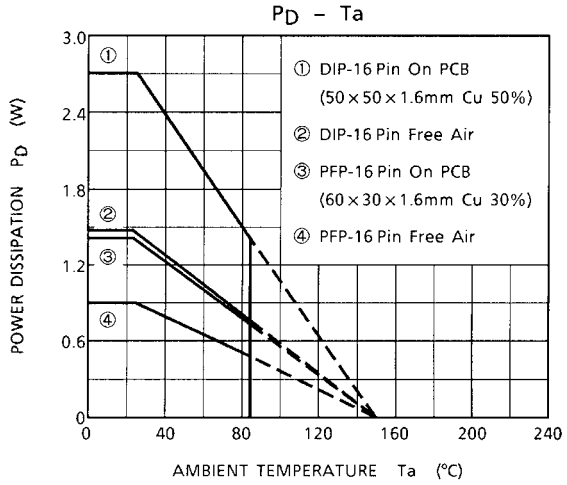
$I_{CC\,(ON)}$ – V_{CC}

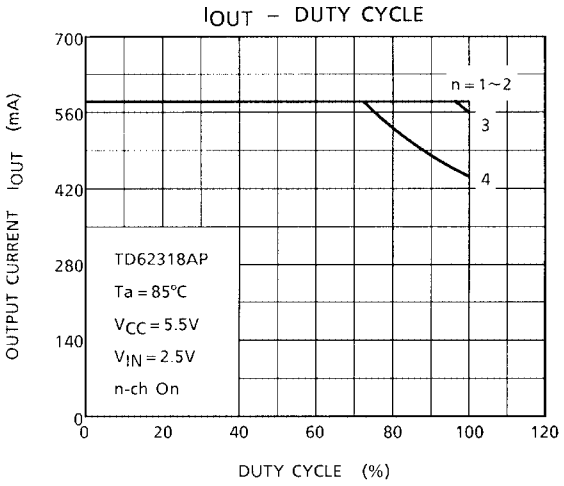


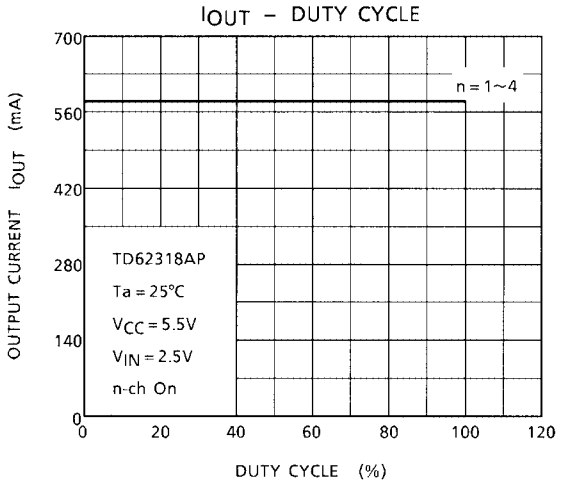
I_F – V_F

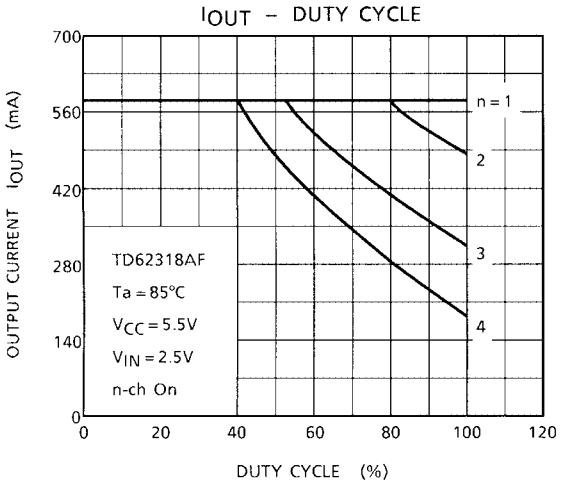


P_D – Ta




IOUT – DUTY CYCLE
OUTPUT CURRENT IOUT (mA)
DUTY CYCLE (%)
n = 1~2
3
4
TD62318AP
Ta = 85°C
VCC = 5.5V
VIN = 2.5V
n-ch On
0
140
280
420
560
700
0
20
40
60
80
100
120


IOUT – DUTY CYCLE
OUTPUT CURRENT IOUT (mA)
DUTY CYCLE (%)
n = 1~4
TD62318AP
Ta = 25°C
VCC = 5.5V
VIN = 2.5V
n-ch On
0
140
280
420
560
700
0
20
40
60
80
100
120


IOUT – DUTY CYCLE
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n = 1
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TD62318AF
Ta = 85°C
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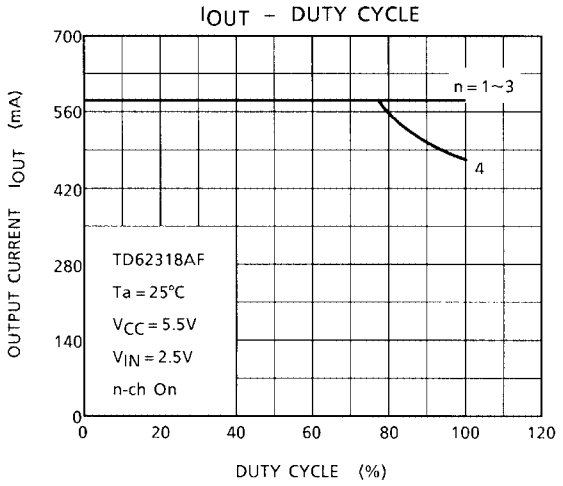
IOUT – DUTY CYCLE
OUTPUT CURRENT IOUT (mA)
DUTY CYCLE (%)
n = 1~3
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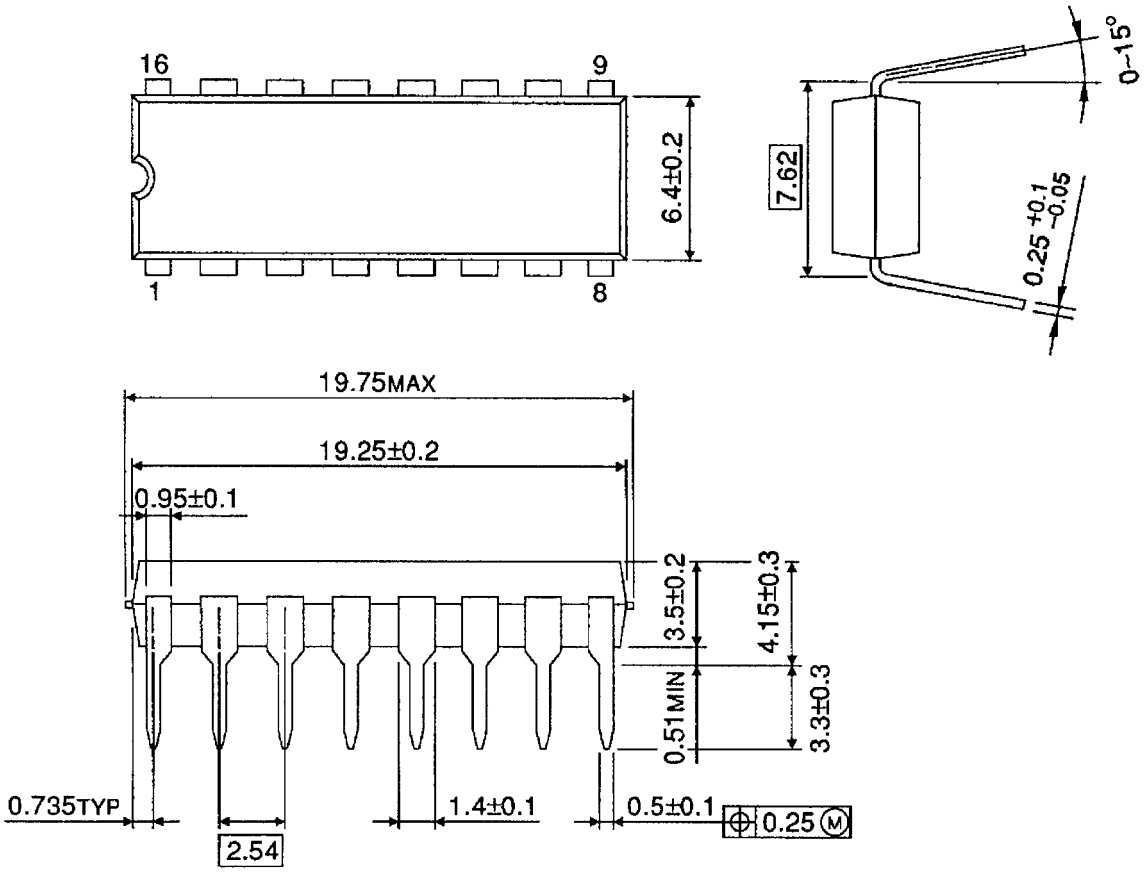
TD62318AF
Ta = 25°C
VCC = 5.5V
VIN = 2.5V
n-ch On
0
140
280
420
560
700
0
20
40
60
80
100
120

PACKAGE DIMENSIONS

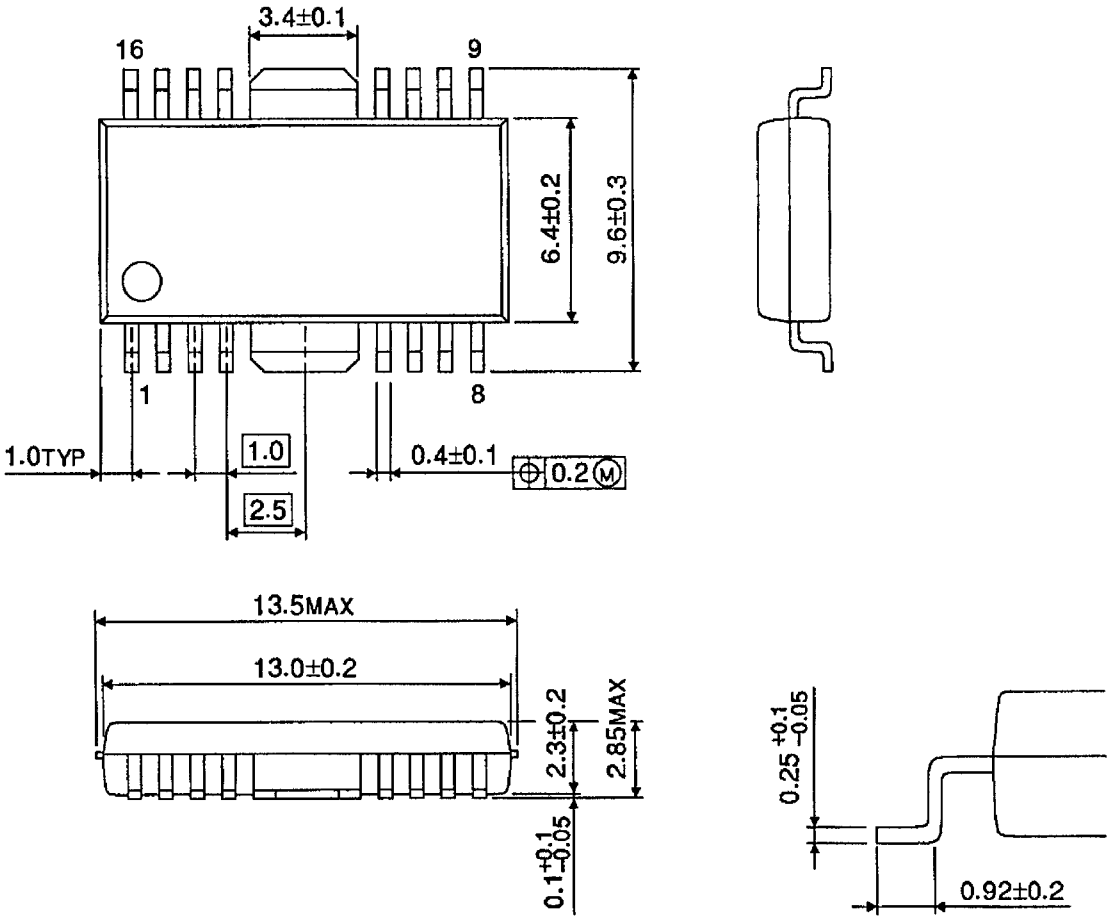
DIP16−P−300−2.54A Unit: mm



Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

HSOP16−P−300−1.00 Unit: mm



Weight: 0.50 g (Typ.)

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