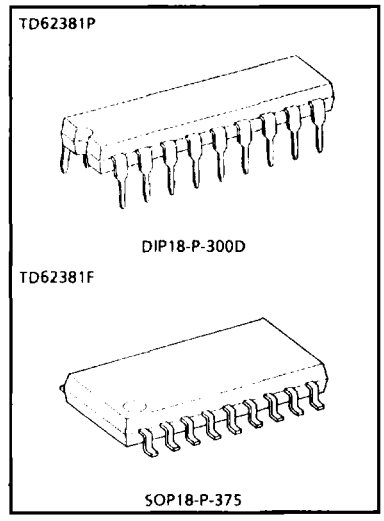
SILICON MONOLITHIC
BIPOLAR DIGITAL INTEGRATED CIRCUIT

TD62381P/F

8CH LOW SATURATION SINK DRIVER

The TD62381P and TD62381F are comprised of eight NPN low saturation drivers. These devices are specifically designed for multiplexed digit driving of eight digit common-cathode LED and also can be employed as a sink driver for multiplexed LED displays using with the TD62785P and TD62785F at standard supply voltage, 5V. Applications include relay, hammer, lamp and LED display drivers.

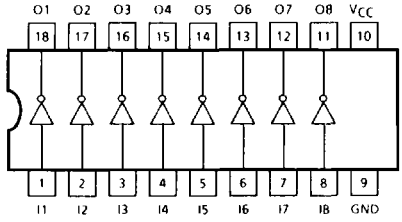


Weight DIP18-P-300D : 1.47g (Typ.)
SOP18-P-375 : 0.41g (Typ.)

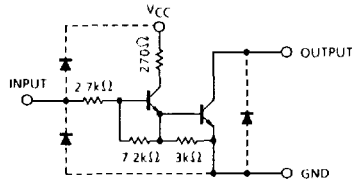
FEATURES

- Low saturation output voltage : $V_{CE\ (sat)} = 0.9V$ (Max.) @$I_{out} = 500mA$
- Output rating 15V (Min.) / 500mA (Max.)
- Input compatible with TTL and 5V CMOS
- Low level active inputs
- Standard supply voltage
- Package type-P : DIP-18pin
- Package type-F : SOP-18pin

PIN CONNECTION (TOP VIEW)



SCHEMATICS (EACH DRIVER)



(Note) The input and output parasitic diodes connot be used as clamp diodes.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	7	V
Output Sustaining Voltage		$V_{CE\ (SUS)}$	15	V
Output Current		I_{OUT}	500	mA / ch
Input Voltage		V_{IN}	7	V
Input Current		I_{IN}	5	mA
Power Dissipation	P	P_D (Note)	1.47	W
	F		0.96	
Operating Temperature		T_{opr}	−40~85	°C
Storage Temperature		T_{stg}	−55~150	°C

(Note) Delated above 25°C in the proportion of 11.7mW / °C (P-Type), 7.7mW / °C (F-Type).

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

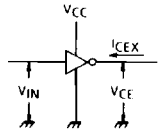
CHARACTERISTIC		SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT
Supply Voltage		V_{CC}	—		4.5	5.0	5.5	V
Output Voltage		V_{OUT}	—		—	—	12	V
Output Current	P	I_{OUT}	DC 1 Circuit, Ta = 25°C		0	—	400	mA / ch
	F				0	—	400	
	P		$T_{pw} \leqq$ 25ms 8 Circuit On Ta = 85°C T_j = 120°C	Duty = 10%	0	—	400	
				Duty = 50%	0	—	350	
	F			Duty = 10%	0	—	400	
				Duty = 50%	0	—	330	
Input Voltage		V_{IN}	—		0	—	V_{CC}	V
	Output On	$V_{IN\ (ON)}$	—		2.4	—	V_{CC}	
	Output Off	$V_{IN\ (OFF)}$	—		0	—	0.4	
Power Dissipation	P	P_D	—		—	—	0.52	W
	F		—		—	—	0.35	

ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_{CC} = 5V)

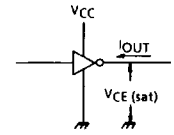
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Leakage Current	I_{CEX}	1	V_{IN} = OPEN V_{OUT} = 12V, Ta = 85°C	—	—	100	μA
Output Saturation Voltage	$V_{CE\ (sat)}$	2	I_{OUT} = 500mA	—	—	0.9	V
			I_{OUT} = 350mA	—	—	0.7	
Input Current	$I_{IN\ (ON)}$	3	V_{CC} = 5V, V_{IN} = 2.4V	—	0.4	0.7	mA
Input Voltage (Output On)	$V_{IN\ (ON)}$	—	V_{CC} = 5V	—	—	2.4	V
Supply Current	I_{CC}	4	V_{CC} = V_{IN} = 5V	—	—	17	mA / ch
Turn-On Delay	t_{ON}	5	V_{OUT} = 10V, R_L = 20Ω C_L = 15pF	—	0.1	—	μs
Turn-Off Delay	t_{OFF}			—	1.2	—	μs

TEST CIRCUIT

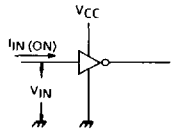
1. I_{CEX}



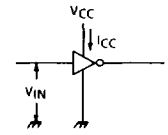
2. $V_{CE\ (sat)}$



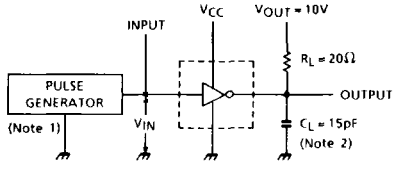
3. $I_{IN\ (ON)}$

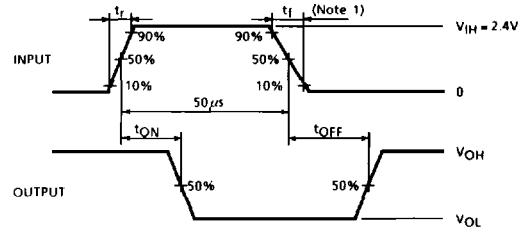


4. I_{CC}



5. t_{ON}, t_{OFF}

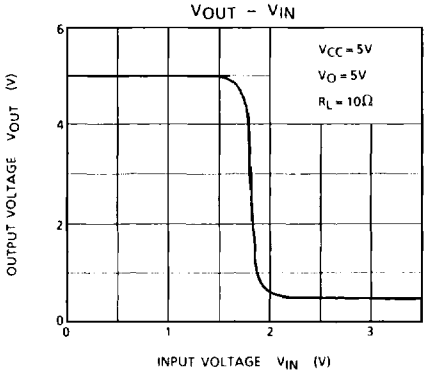




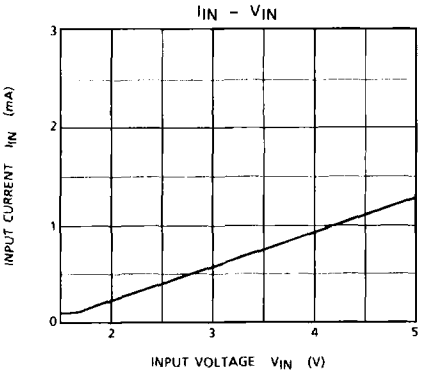
(Note 1) Pulse Width 50μs, Duty Cycle 10%
Output Impedance 50Ω, $t_r \leqq 5$ns, $t_f \leqq 10$ns

(Note 2) C_L includes probe and jig capacitance.

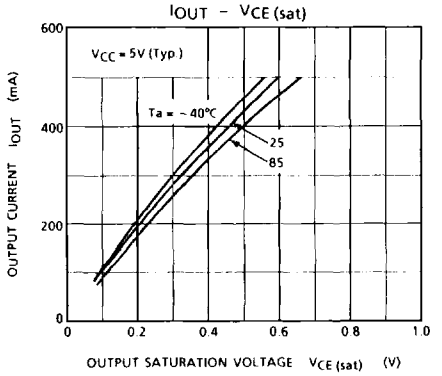
V_{OUT} – V_{IN}



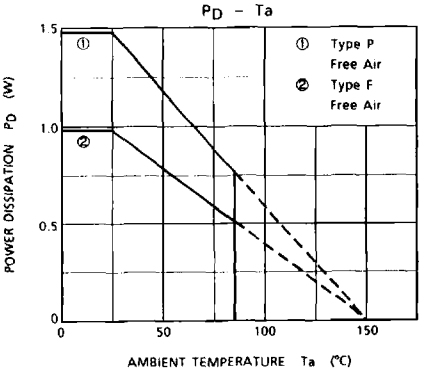
I_{IN} – V_{IN}



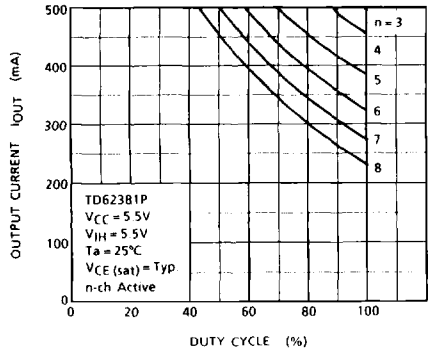
I_{OUT} – $V_{CE(sat)}$



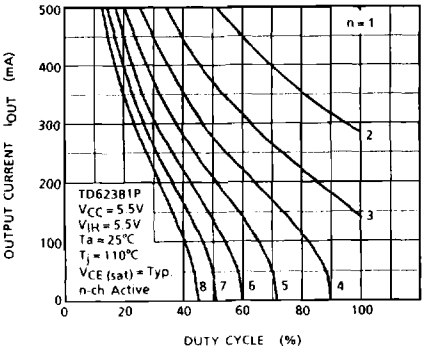
P_D – Ta

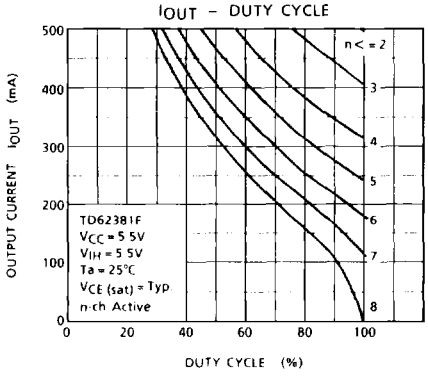


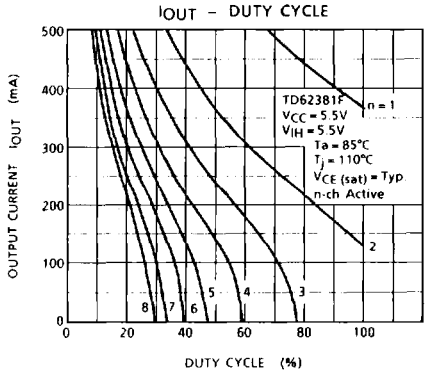
I_{OUT} – DUTY CYCLE



I_{OUT} – DUTY CYCLE




IOUT – DUTY CYCLE
OUTPUT CURRENT IOUT (mA)
DUTY CYCLE (%)
n < = 2
3
4
5
6
7
8
TD62381F
VCC = 5.5V
VIH = 5.5V
Ta = 25°C
VCE (sat) = Typ.
n-ch Active
0
100
200
300
400
500
0
20
40
60
80
100


IOUT – DUTY CYCLE
OUTPUT CURRENT IOUT (mA)
DUTY CYCLE (%)
TD62381F
VCC = 5.5V
VIH = 5.5V
Ta = 85°C
Tj = 110°C
VCE (sat) = Typ.
n-ch Active
n = 1
2
3
4
5
6
7
8
0
100
200
300
400
500
0
20
40
60
80
100