TOSHIBA CMOS Linear Integrated Circuit Silicon Monolithic

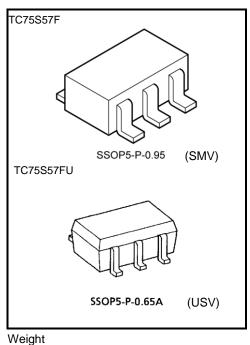
TC75S57F, TC75S57FU

Single Comparator

The TC75S57F/TC75S57FU is a CMOS general-purpose single comparator. The device can operate off a single power supply and draws a lower supply current than a conventional bipolar general-purpose comparator. This device's push-pull output stage can be directly connected to TTL or CMOS logic ICs, among others.

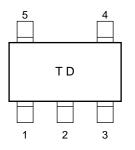
Features

- Low-current power supply $: I_{DD} = 100 \ \mu A \ (typ.)$
- Single power supply operation : $VDD = \pm 0.9$ to ± 3.5 V or 1.8 to 7 V
- Wide common mode input voltage range : VSS to VDD 0.9 V
- Push-pull output circuit
- Low input bias current
- Small package

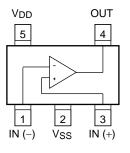


Weight SSOP5-P-0.95 : 0.014 g (typ.) SSOP5-P-0.65A : 0.006 g (typ.)

Marking (top view)



Pin Connection (top view)



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Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply voltage	Vdd, Vss	±3.5 or 7	V
Differential input voltage	DVIN	±7	V
Input voltage	VIN	Vss to VDD	V
Output Current	IOUT	±35	mA
Power dissipation	PD	200	mW
Operating temperature	Topr	-40 to 85	°C
Storage temperature	T _{stg}	-55 to 125	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note: This device's CMOS structure makes it prone to latch-up. To prevent latch-up, please take the following precautions:

- Ensure that no I/O pin's voltage level ever exceeds V_{DD} or drops below V_{SS}. In addition, check the power-on timing.
- Do not subject the device to excessive noise.

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Electrical Characteristics (unless otherwise specified, $V_{DD} = 5 V$, $V_{SS} = GND$, $Ta = 25^{\circ}C$)

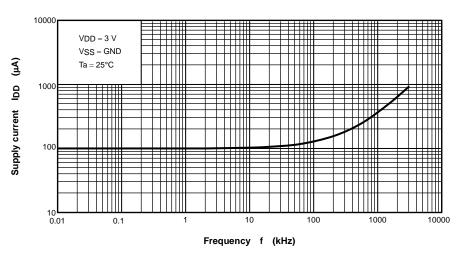
Characteristics	Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Input offset voltage	VIO		—	_	±1	±7	mV
Input offset current	lio		_	_	1	_	pА
Input bias current	li li		—	_	1	—	pА
Common mode input voltage	CMVIN	_	—	0	_	4.1	V
Supply current	IDD (Note)	_	—	_	110	220	μA
Voltage gain	Gv	_	—	_	94	_	dB
Sink current	I _{sink}		$V_{OL} = 0.5 V$	13	25	_	mA
Source current	I _{source}	_	V _{OH} = 4.5 V	9	21	—	mA
Output voltage	Vol	_	$I_{sink} = 5.0 \text{ mA}$	_	0.1	0.3	V
	Vон	_	Isource = 5.0 mA	4.7	4.9	—	
Operating supply voltage	V _{DD}	_	—	1.8		7.0	V
Propagation delay time (turn on)	tPLH (1)	_	Over drive = 100 mV	_	140	—	ns
	tPLH (2)	_	TTL step input	_	90	—	
Propagation delay time (turn off)	tPHL (1)		Over drive = 100 mV		90		ns
	tPHL (2)		TTL step input	_	70		
Response time	t _{TLH}		Over drive = 100 mV	_	11	_	- ns
	tTHL		Over drive = 100 mV		7		

Electrical Characteristics (unless otherwise specified, V_{DD} = 3 V, V_{SS} = GND, Ta = 25°C)

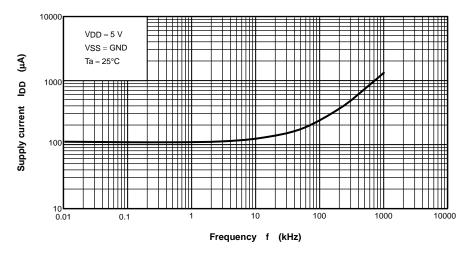
Characteristics	Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Input offset voltage	VIO		—		±1	±7	mV
Input offset current	lio		—		1		pА
Input bias current	lı		—		1	_	pА
Common mode input voltage	CMVIN	_	_	0	_	2.1	V
Supply current	I _{DD} (Note)		_		100	200	μA
Sink current	I _{sink}		V _{OL} = 0.5 V	6	18		mA
Source current	Isource		Voh = 2.5 V	3	15		mA
Output voltage	Vol		I _{sink} = 5.0 mA		0.15	0.35	v
	VOH		I _{source} = 5.0 mA	2.65	2.85	_	
Propagation delay time (turn on)	tPLH		Over drive = 100 mV		110	_	ns
Propagation delay time (turn off)	t PHL	_	Over drive = 100 mV		90		ns
Response time	tтlн	—	Over drive = 100 mV	_	7	—	ns
	t _{THL}		Over drive = 100 mV		8		

Note: This device's current consumption increases as its operating frequency increases. Note that the power dissipation should not exceed the allowable power dissipation.

I_{DD} – f

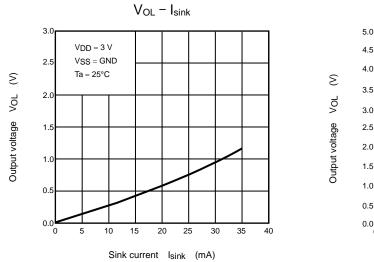


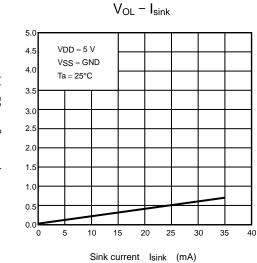




The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

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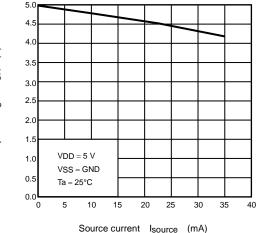


V_{OH} - I_{source} 3.0 2. S 2.0 Output voltage VOH 1.5 1.0 VDD = 3 V VSS = GND 0.5 Ta = 25°C 0.0 0 5 10 15 20 25 30 35 40 Source current Isource (mA)

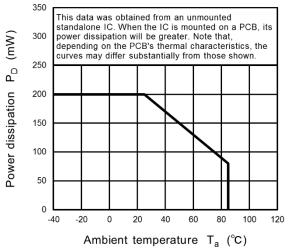








P_D – Ta



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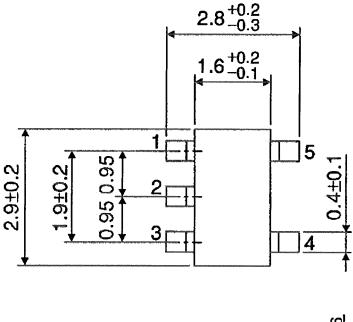
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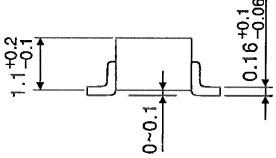
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Package Dimensions

SSOP5-P-0.95

Unit : mm



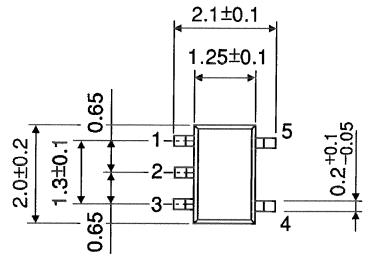


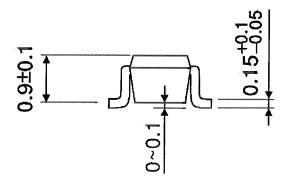
Weight: 0.014 g (typ.)



Package Dimensions

Unit : mm





Weight: 0.006 g (typ.)

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