FORCE TECHNOLOGIES LTD

FT1011/FT1011A

Voltage Comparator

Features

- Pin Compatible with FT111 Series Devices
- *Guaranteed* Max 0.5mV Input Offset Voltage
- *Guaranteed* Max 25nA Input Bias Current
- *Guaranteed* Max 3nA Input Offset Current
- *Guaranteed* Max 250ns Response Time
- *Guaranteed* Min 200,000 Voltage Gain
- 50mA Output Current Source or Sink
- ±30V Differential Input Voltage
- Fully Specified for Single 5V Operation

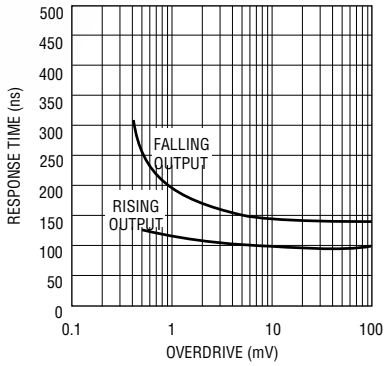
Applications

- SAR A/D Converters
- Voltage-to-Frequency Converters
- Precision RC Oscillator
- Peak Detector
- Motor Speed Control
- Pulse Generator
- Relay/Lamp Driver

Description

The FT1011 is a general purpose comparator with significantly better input characteristics than the FT111. Although pin compatible with the FT111, it offers four times lower bias current, six times lower offset voltage and five times higher voltage gain. Offset voltage drift, a previously unspecified parameter, is guaranteed at 15μV/°C. Additionally, the supply current is lower by a factor of two with no loss in speed. The FT1011 is several times faster than the FT111 when subjected to large overdrive conditions. It is also fully specified for DC parameters and response time when operating on a single 5V supply. These parametric improvements allow the FT1011 to be used in high accuracy (≥12-bit) systems without trimming. In a 12-bit A/D application, for instance, using a 2mA DAC, the offset error introduced by the FT1011 is less than 0.5LSB. The FT1011 retains all the versatile features of the FT111, including single 3V to ±18V supply operation, and a floating transistor output with 50mA source/sink capability. It can drive loads referenced to ground, negative supply or positive supply, and is specified up to 50V between V^- and the collector output. A differential input voltage up to the full supply voltage is allowed, even with ±18V supplies, enabling the inputs to be clamped to the supplies with simple diode clamps.

Response Time vs Overdrive

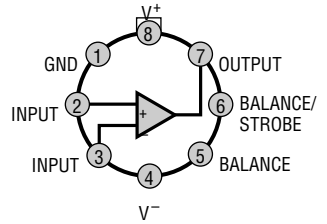


Absolute Maximum Rating (Note 1)

Supply Voltage (Pin 8 to Pin 4) 36V
Output to Negative Supply (Pin 7 to Pin 4)
FT1011AC, FT1011C 40V
FT1011AI, FT1011I 40V
FT1011AM, FT1011M 50V
Ground to Negative Supply (Pin 1 to Pin 4) 30V
Differential Input Voltage ..... ±36V
Voltage at STROBE Pin (Pin 6 to Pin 8) 5V

Input Voltage (Note 2) ..... Equal to Supplies
Output Short-Circuit Duration ..... 10 sec
Operating Temperature Range (Note 3)
FT1011AC, FT1011C ..... 0°C to 70°C
FT1011AI, FT1011I ..... –40°C to 85°C
FT1011AM, FT1011M –55°C to 125°C
Storage Temperature Range ..... – 65°C to 150°C
Lead Temperature (Soldering, 10 sec) ..... 300°C

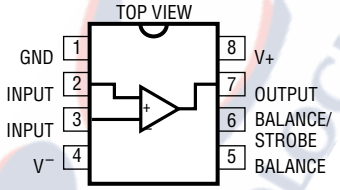
Package/Order Information



H PACKAGE
8-LEAD TO-5 METAL CAN

T_{JMAX} = 150°C, θ_{JA} = 150°C/W, θ_{JC} = 45°C/W

ORDER PART NUMBER
FT1011ACH
FT1011CH
FT1011AMH
FT1011MH



N8 PACKAGE
8-LEAD PDIP

S8 PACKAGE
8-LEAD PLASTIC SO

T_{JMAX} = 150°C, θ_{JA} = 130°C/W(N8)
T_{JMAX} = 150°C, θ_{JA} = 150°C/W(S8)

ORDER PART NUMBER
FT1011ACN8
FT1011CN8
FT1011CS8
FT1011AIS8
FT1011IS8

S8 PART MARKING
1011
1011AI
1011I

J8 PACKAGE 8-LEAD CERDIP
T_{JMAX} = 150°C, θ_{JA} = 100°C/W(J8)

ORDER PART NUMBER	
FT1011ACJ8	FT1011AMJ8
FT1011CJ8	FT1011MJ8

Electrical Characteristics

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at T_A = 25°C. V_S = ±15V, V_{CM} = 0V, R_S = 0Ω, V_1 = –15V, output at pin 7 unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS		FT1011AC/AI/AM MIN	FT1011AC/AI/AM TYP	FT1011AC/AI/AM MAX	FT1011C/I/M MIN	FT1011C/I/M TYP	FT1011C/I/M MAX	UNITS
V_{OS}	Input Offset Voltage	(Note 4)			0.3	0.5		0.6	1.5	mV
			●			1.0			3.0	mV
	*Input Offset Voltage	$R_S \leq$ 50k (Note 5)				0.75			2.0	mV
			●			1.50			3.0	mV
I_{OS}	*Input Offset Current	(Note 5)			0.2	3		0.2	4	nA
			●			5			6	nA
I_B	Input Bias Current	(Note 4)			15	25		20	50	nA
	*Input Bias Current	(Note 5)			20	35		25	65	nA
			●			50			80	nA

*Indicates parameters which are guaranteed for all supply voltages, including a single 5V supply. See Note 5.

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