

## 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
- $\pm 30\text{V}$  Differential Input Voltage
- Fully Specified for Single 5V Operation

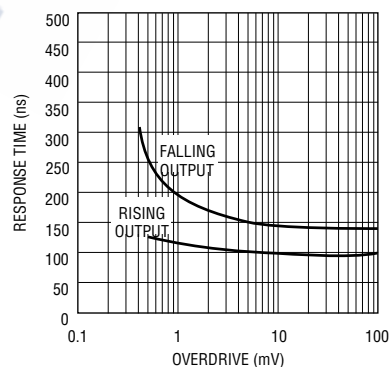
## Applications

- 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  $15\mu\text{V}/^\circ\text{C}$ . 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 ( $\geq 12$ -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  $\pm 18\text{V}$  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  $\pm 18\text{V}$  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	Input Voltage (Note 2) .....	Equal to Supplies
Output to Negative Supply (Pin 7 to Pin 4)		Output Short-Circuit Duration .....	10 sec
FT1011AC, FT1011C .....	40V	Operating Temperature Range (Note 3)	
FT1011AI, FT1011I .....	40V	FT1011AC, FT1011C .....	0°C to 70°C
FT1011AM, FT1011M .....	50V	FT1011AI, FT1011I .....	-40°C to 85°C
Ground to Negative Supply (Pin 1 to Pin 4) .....	30V	FT1011AM, FT1011M .....	-55°C to 125°C
Differential Input Voltage .....	±36V	Storage Temperature Range .....	-65°C to 150°C
Voltage at STROBE Pin (Pin 6 to Pin 8) .....	5V	Lead Temperature (Soldering, 10 sec) .....	300°C

### Package/Order Information

TOP VIEW	ORDER PART NUMBER	TOP VIEW	ORDER PART NUMBER
<p>H PACKAGE 8-LEAD TO-5 METAL CAN</p> <p><math>T_{JMAX} = 150^{\circ}\text{C}</math>, <math>\theta_{JA} = 150^{\circ}\text{C/W}</math>, <math>\theta_{JC} = 45^{\circ}\text{C/W}</math></p>	<p>FT1011ACH</p> <p>FT1011CH</p> <p>FT1011AMH</p> <p>FT1011MH</p>	<p>N8 PACKAGE 8-LEAD PDIP      S8 PACKAGE 8-LEAD PLASTIC SO</p> <p><math>T_{JMAX} = 150^{\circ}\text{C}</math>, <math>\theta_{JA} = 130^{\circ}\text{C/W}</math> (N8)  <math>T_{JMAX} = 150^{\circ}\text{C}</math>, <math>\theta_{JA} = 150^{\circ}\text{C/W}</math> (S8)</p>	<p>FT1011ACN8</p> <p>FT1011CN8</p> <p>FT1011CS8</p> <p>FT1011AIS8</p> <p>FT1011IS8</p>
			S8 PART MARKING
			1011 1011AI 1011I
		J8 PACKAGE 8-LEAD CERDIP $T_{JMAX} = 150^{\circ}\text{C}$ , $\theta_{JA} = 100^{\circ}\text{C/W}$ (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  $T_A = 25^{\circ}\text{C}$ .  
 $V_S = \pm 15\text{V}$ ,  $V_{CM} = 0\text{V}$ ,  $R_S = 0\Omega$ ,  $V_I = -15\text{V}$ , output at pin 7 unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS		FT1011AC/AI/AM			FT1011C/I/M			UNITS
				MIN	TYP	MAX	MIN	TYP	MAX	
$V_{OS}$	Input Offset Voltage	(Note 4)	●		0.3	0.5		0.6	1.5	mV
						1.0			3.0	mV
	*Input Offset Voltage	$R_S \leq 50\text{k}$ (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.



Ashley Crt, Henley,  
Marlborough, Wilts, SN8 3RH UK

**Tel: +44(0)1264 731200**

**Fax: +44(0)1264 731444**

E-mail

[info@forcetechnologies.co.uk](mailto:info@forcetechnologies.co.uk)

[tech@forcetechnologies.co.uk](mailto:tech@forcetechnologies.co.uk)

[sales@forcetechnologies.co.uk](mailto:sales@forcetechnologies.co.uk)

**[www.forcetechnologies.co.uk](http://www.forcetechnologies.co.uk)**

Unless otherwise stated in this SCD/Data sheet, Force Technologies Ltd reserve the right to make changes, without notice, in the products, including circuits, cells and/or software, described or contained herein in order to improve design and/or performance. Force Technologies resumes no responsibility or liability for the use of any of these products, conveys no licence or any title under patent, copyright, or mask work to these products, and makes no representation or warranties that that these products are free from patent, copyright or mask work infringement, unless otherwise specified.

**Life Support Applications**

Force Technologies products are not designed for use in life support appliances, devices or systems where malfunction of a Force Technologies product can reasonably be expected to result in a personal injury. Force Technologies customers using or selling Force Technologies products for use in such applications do so at their own risk and agree to fully indemnify Force Technologies for any damages resulting from such improper use or sale.

All trademarks acknowledged

Copyright Force Technologies Ltd 2007

**Click here to request data sheet**