SILICON DUAL VARIABLE CAPACITANCE DIODE

SUMMARY V_{BB}=25V; I_B=20nA; C_d=33pF(Nom)

DESCRIPTION

The FSD270 is a new hyperabrupt SOT23 packaged dual common cathode varactor diode , offering users both compact circuit design and impressive performance comprising tightly controlled CV characteristics, a capacitance of typically 33 pf @ 2V,excellent phase noise performance and high Q of 200 min.

This superior performance in the VHF and UHF ranges has been optimised to meet the high filtering requirements of a wide range of Digital Audio Broadcasting (DAB) module circuits , mobile radios, pagers, voltage controlled crystal oscillators (VCXO) and temperature controlled crystal oscillators (TCXO).

FEATURES

- Common Cathode dual Diode (monolithic construction)
- VHF- UHF operation
- Close tolerance CV characteristics
- High Tuning Ratio
- Low I_R, enabling excellent Phase Noise Performance (I_R typically < 200pA @ 20V)
- High Q

APPLICATIONS

- DAB Receiver Modules for use with:
 - -Low voltage battery portables -Hi-Fi
 - -In car radio -MP3 players
- Voltage and Temperature Controlled Crystal Oscillators
- Mobile Radio and Pagers.

ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
FSD270TA	7'' (180mm)	8mm embossed	3000 units

The FSD270 is capacitance selected into 3 bands. A reel will only contain one band - A,B or C. Shipments of more than 1 reel may contain reels from different bands.

ISSUE 1 - AUGUST 2002

PIN CONFIGURATION

SOT23







ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Forward Current (single diode)	I _F	200	mA
Power Dissipation at T _{amb} =25°C (a) Linear Derating Factor	P _D	330 3	mW mW/°C
Operating and Storage Temperature Range	T _j :T _{stg}	-55 to +150	°C

NOTES

(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Reverse Breakdown Voltage	V _{BR}	25			V	Ι _R = 10μΑ
Reverse Leakage Current	I _R		0.2	20	nA	V _R = 20V
Temperature Coefficient	η			400	ppm/°C	V _R = 3V, f=1MHz
Diode Capacitance	C _d	29.7	33.0	36.3	pF	V _R = 2V, f=1MHz
Capacitance Ratio	C _d / C _d	5.0		6.5		$V_R = 2V/20V$, f=1MHz
Figure of Merit	٥	200				$V_R = 3V$, f=50MHz

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}C$).

Additional CV matching capability:

Zetex recognise that some applications ie filtering in digital audio receiver circuits, require these dual varactors to be very tightly matched. To meet this requirement devices can be supplied tested into capacitance bands at the 2V condition.

Each (TA) reel will contain 3000 devices carrying only diodes tested into a single band and each device will have a partmark identifying the capacitance band which they meet.

As this is a final test measurement customers will not have the option to specify a capacitance at the time of ordering and will be obliged to accept the band into which the devices are tested.

- Purchase orders can be placed in multiples of 3000 units / reel for device type FSD270TA

- Samples can be obtained from Zetex Plc quoting device type #FSD270TA

	MIN.	MAX.	UNIT	PART NUMBER
BAND A	29.7	32.1	pF	70A
BAND B	31.9	34.1	pF	70B
BAND C	33.9	36.3	pF	70C



APPLICATIONS INFORMATION

FSD270 in Digital Audio Broadcasting (DAB) Circuits

Digital audio is set to dominate car radio and other mobile radio applications. Most of the required functions can be achieved with a single integrated circuit. One parts of the circuit that are not integrated are the Voltage Controlled Oscillator (VCO) used in the Phase-Locked Loop (PLL) channel selection circuit and the tracking filters. Figure 1 shows the FSD270 dual variable capacitance diode (also known as varactor or tuner diode) in a DAB application. Most textbook circuits show a single variable capacitance diode in place of the FSD270. In practice radio frequency oscillations in the tracking filters can drive the single diode into conduction on peaks increasing the bias voltage and giving rise to undesirable harmonics. Common-cathode variable capacitance diodes are used to overcome this problem. The FSD270 dual common cathode device in the space saving SOT23 package has been optimized for this application. Zetex application note AN9 covers our range of variable capacitance diodes and their applications in detail.



Figure 1.

ISSUE 1 - AUGUST 2002





4

CHARACTERISTICS



ISSUE 1 - AUGUST 2002





PACKAGE DIMENSIONS

DIM	Millimetres		Inches	
	Min	Max	Min	Max
А	2.67	3.05	0.105	0.120
В	1.20	1.40	0.047	0.055
С	-	1.10	-	0.043
D	0.37	0.53	0.0145	0.021
F	0.085	0.15	0.0033	0.0059
G	NOM 1.9		NOM	0.075
К	0.01	0.10	0.0004	0.004
L	2.10	2.50	0.0825	0.0985
N	NOM 0.95		NOM 0.037	

© Zetex plc 2002

Europe		Americas	Asia Pacific
Zetex plc	Zetex GmbH	Zetex Inc	Zetex (Asia) Ltd
Fields New Road	Streitfeldstraße 19	700 Veterans Memorial Hwy	3701-04 Metroplaza, Tower 1
Chadderton	D-81673 München	Hauppauge, NY11788	Hing Fong Road
Oldham, OL9 8NP			Kwai Fong
United Kingdom	Germany	USA	Hong Kong
Telephone (44) 161 622 4422	Telefon: (49) 89 45 49 49 0	Telephone: (631) 360 2222	Telephone: (852) 26100 611
Fax: (44) 161 622 4420	Fax: (49) 89 45 49 49 49	Fax: (631) 360 8222	Fax: (852) 24250 494
uk.sales@zetex.com	europe.sales@zetex.com	usa.sales@zetex.com	asia.sales@zetex.com

These offices are supported by agents and distributors in major countries world-wide.

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.

For the latest product information, log on to **www.zetex.com**

ISSUE 1 - AUGUST 2002

