

## FSD270

### SILICON DUAL VARIABLE CAPACITANCE DIODE

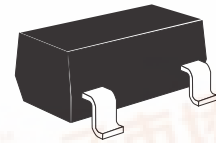
#### SUMMARY

$V_{BR}=25V$ ;  $I_R=20nA$ ;  $C_d=33pF(Nom)$

#### 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).



SOT23

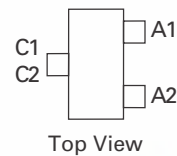
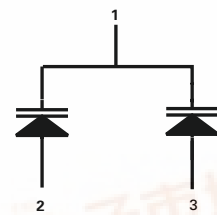
#### FEATURES

- 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.

#### PIN CONFIGURATION



#### 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.

# FSD270

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Forward Current (single diode)	$I_F$	200	mA
Power Dissipation at $T_{amb}=25^{\circ}\text{C}$ (a) Linear Derating Factor	$P_D$	330 3	mW mW/ $^{\circ}\text{C}$
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^{\circ}\text{C}$

### 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

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Reverse Breakdown Voltage	$V_{BR}$	25			V	$I_R = 10\mu\text{A}$
Reverse Leakage Current	$I_R$		0.2	20	nA	$V_R = 20\text{V}$
Temperature Coefficient	$\eta$			400	ppm/ $^{\circ}\text{C}$	$V_R = 3\text{V}$ , $f=1\text{MHz}$
Diode Capacitance	$C_d$	29.7	33.0	36.3	pF	$V_R = 2\text{V}$ , $f=1\text{MHz}$
Capacitance Ratio	$C_d / C_d$	5.0		6.5		$V_R = 2\text{V}/20\text{V}$ , $f=1\text{MHz}$
Figure of Merit	Q	200				$V_R = 3\text{V}$ , $f=50\text{MHz}$

### 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

# FSD270

## 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 part 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.

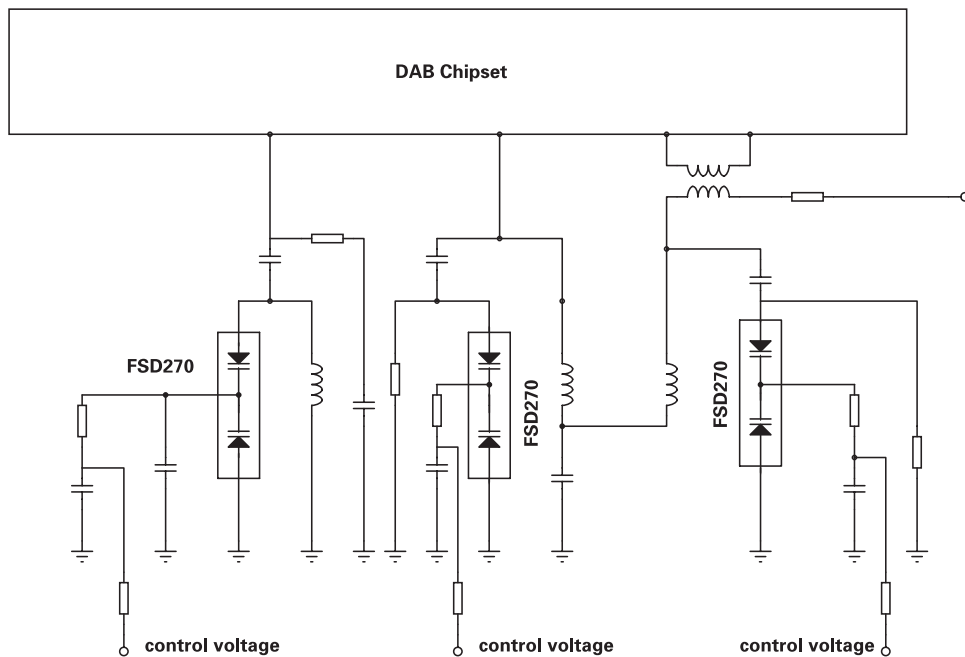
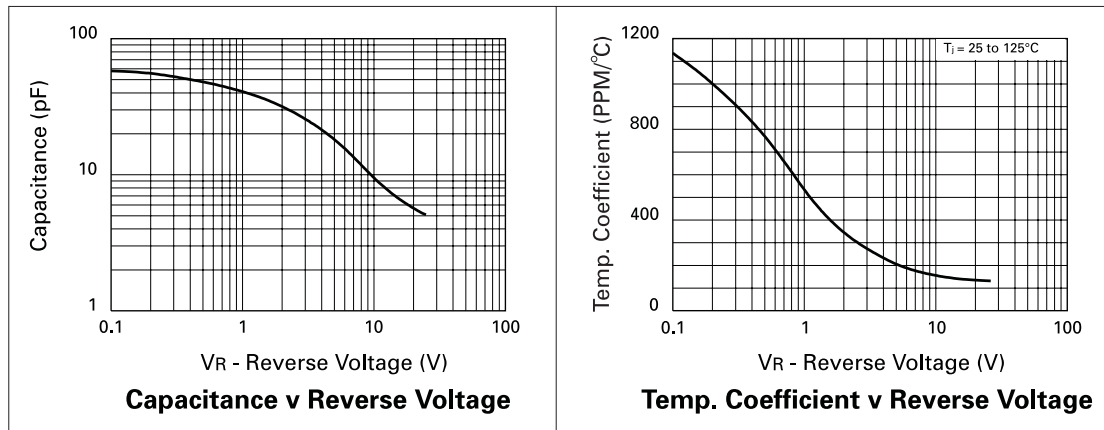


Figure 1.

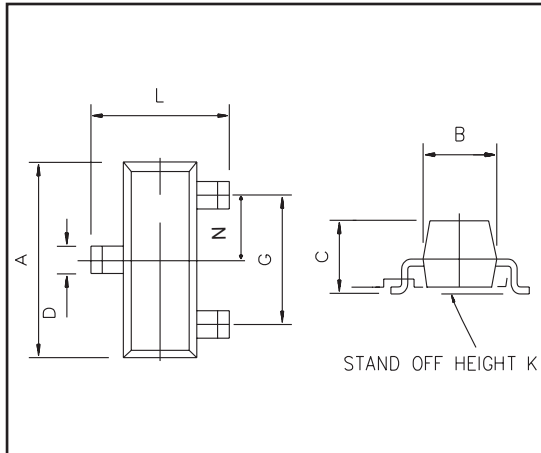
# FSD270

## CHARACTERISTICS

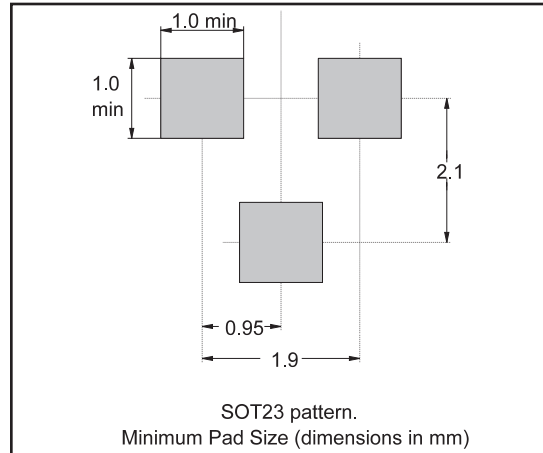


# FSD270

## PACKAGE OUTLINE



## PAD LAYOUT DETAILS



## PACKAGE DIMENSIONS

DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	2.67	3.05	0.105	0.120
B	1.20	1.40	0.047	0.055
C	-	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	
K	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 Fields New Road Chadderton Oldham, OL9 8NP United Kingdom Telephone (44) 161 622 4422 Fax: (44) 161 622 4420 uk.sales@zetex.com	Zetex GmbH Streitfeldstraße 19 D-81673 München  Germany Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com	Zetex (Asia) Ltd 3701-04 Metroplaza, Tower 1 Hing Fong Road Kwai Fong Hong Kong Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com
	Zetex Inc 700 Veterans Memorial Hwy Hauppauge, NY11788  USA Telephone: (631) 360 2222 Fax: (631) 360 8222 usa.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](http://www.zetex.com)

ISSUE 1 - AUGUST 2002

