

## SILICON DUAL VARIABLE CAPACITANCE DIODE

### SUMMARY

**$V_{BR}=25V$ ;  $I_R=20nA$ ;  $C_d=47pF(Nom)$**

### DESCRIPTION

The ZDC834A 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 47 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

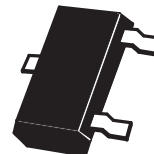
- DAB Receiver Modules for use with:
  - Low voltage battery portables
  - Hi-Fi
  - In car radio
  - MP3 players
- Voltage and Temperature Controlled Crystal Oscillators
- Mobile Radio and Pagers.

### ORDERING INFORMATION

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZDC834ATA	7	8mm embossed	3000 units

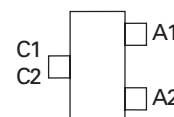
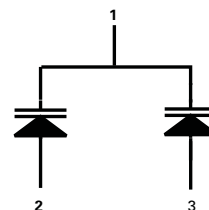
### DEVICE MARKING

- C5A



**SOT23**

### PIN CONFIGURATION



Top View

## 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	$^{\circ}\text{C}$

## THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	417	$^{\circ}\text{C}/\text{W}$

### 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	$C_d$	42.3	47	51.7	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				$V_R = 3\text{V}, f=50\text{MHz}$

## APPLICATIONS INFORMATION

### ZDC834A 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 is not integrated is the Voltage Controlled Oscillator (VCO) used in the Phase-Locked Loop (PLL) channel selection circuit. Figure 1 shows the ZDC834A 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 ZDC834A. In practice radio frequency oscillations in the tank circuit 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 ZDC834A 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.

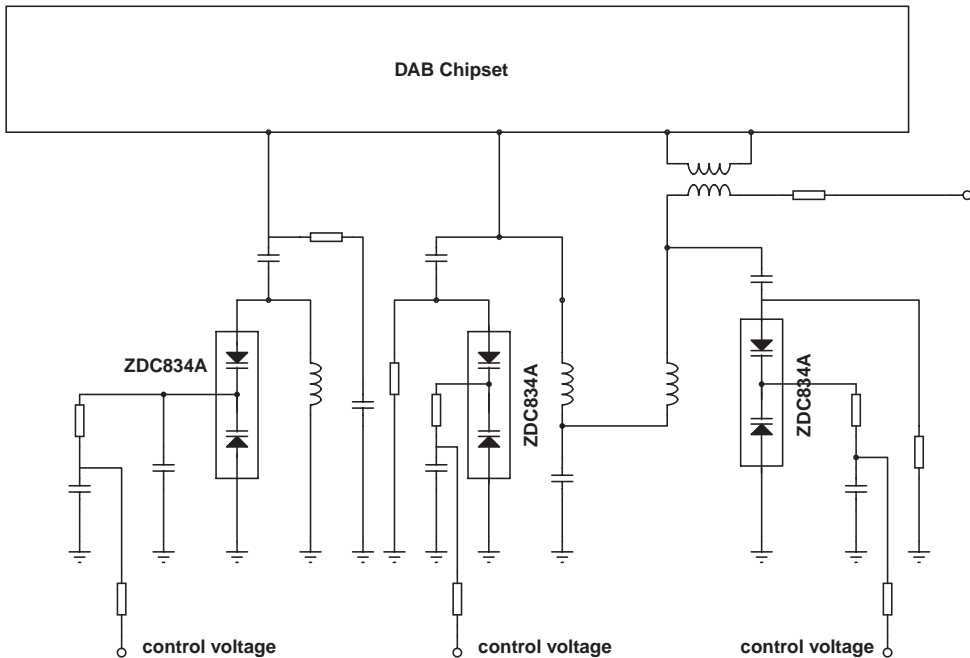
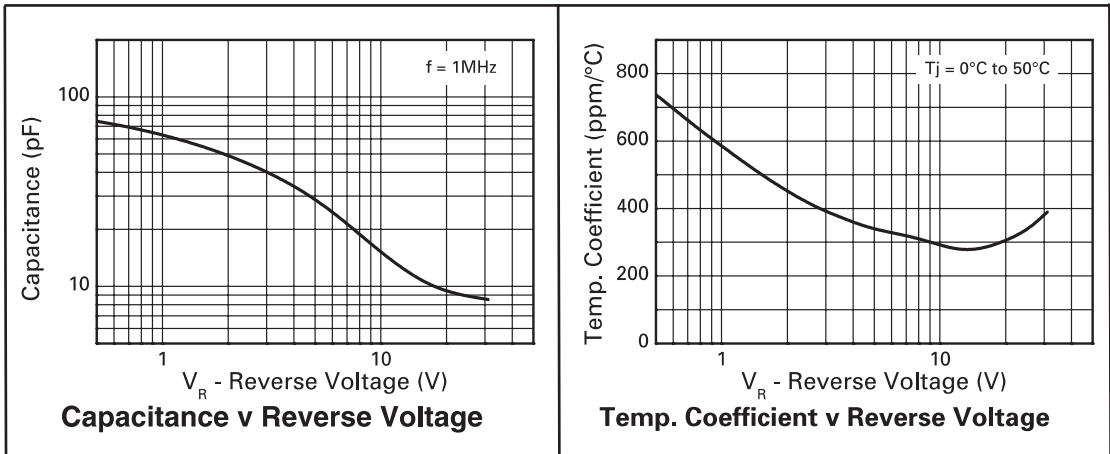


Figure 1

## CHARACTERISTICS



### 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.

### Cd specification at 2V, 1MHz

Band A = 42.3pf to 45.5pf partmark is 71A  
 Band B = 45.4pf to 48.6pf partmark is 71B  
 Band C = 48.5pf to 51.7pf partmark is 71C

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.

Should this be of interest the specification identification would change from ZDC834A to FSD271 and

- **Purchase orders** can be placed in multiples of 3000 units / reel for device type **FSD271TA**

- **Samples** can be obtained from Zetex Plc quoting device type **#FSD271TA**



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