

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

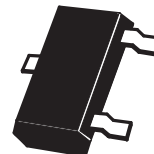
- DAB Receiver Modules for use with:
 - Low voltage battery portables
 - Hi-Fi
 - In car radio
 - MP3 players
- Voltage and Temperature Controlled Crystal Oscillators
- Mobile Radio and Pagers.

ORDERING INFORMATION

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

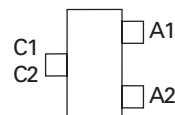
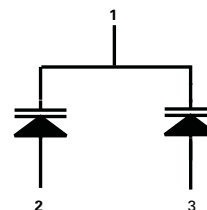
DEVICE MARKING

- 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	η			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.

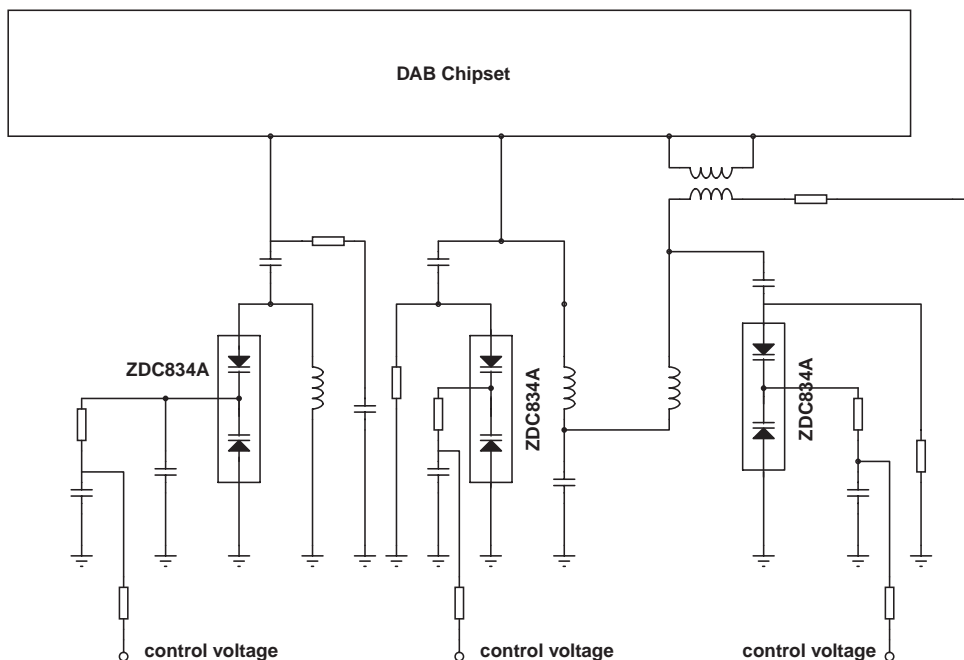
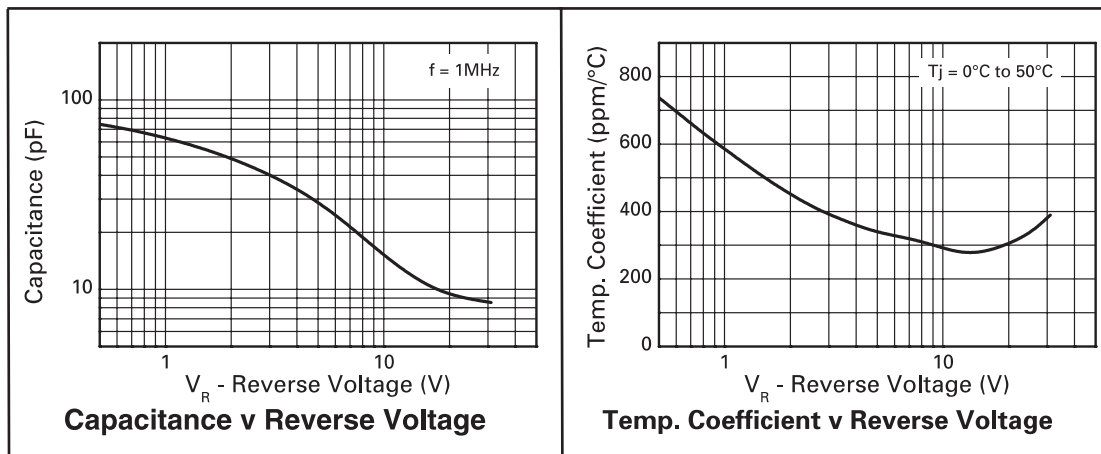


Figure 1

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**



Zetex plc.
Fields New Road, Chadderton, Oldham, OL9-8NP, United Kingdom.
Telephone: (44)161 622 4422 (Sales), (44)161 622 4444 (General Enquiries)
Fax: (44)161 622 4420

Zetex GmbH
Streitfeldstraße 19
D-81673 München
Germany
Telephone: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49

Zetex Inc.
47 Mall Drive, Unit 4
Commack NY 11725
USA
Telephone: (631) 543-7100
Fax: (631) 864-7630

Zetex (Asia) Ltd.
3701-04 Metroplaza, Tower 1
Hing Fong Road,
Kwai Fong, Hong Kong
Telephone: (852) 26100 611
Fax: (852) 24250 494

These are supported by
agents and distributors in
major countries world-wide
© Zetex plc 2001

www.zetex.com

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.