4T Tuning switch, R_{ON}=0.5Ω, V=100 V

Features

- Full integrated solution, single V_{DD}=2.6...5.25 V
- Frequency Range 30 MHz to 1000 MHz
- $R_{ON} = 0.5\,\Omega$
- 50 W CW Power
- $V_{PEAK} = 100$ V
- Highest pulse power in the industry
- No sudden voltage breakdown compared to SOI
- Switch time = 5.9 μs, no power derating
- Low power consumption, less than 1 mW
- No need to supply negative voltages

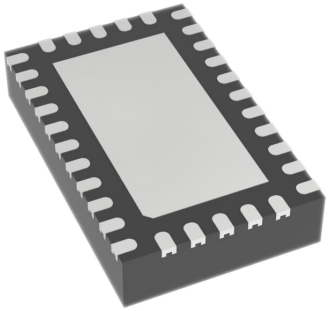

Figure 1: TS63430D in 6.0 x 3.0 mm^2 QFN 32-pin package.

Applications

- Tactical radio
- Tunable filters
- Antenna tuning
- Medical - Ultrasound
- Medical - MRI

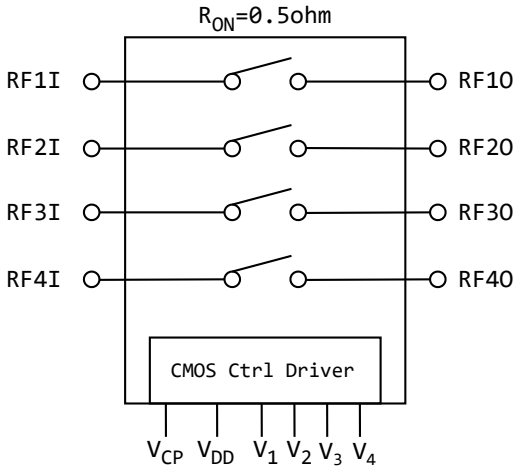

Figure 2: TS63430D functional diagram

General Description

The TS63430D is a HF/VHF/UHF/L-band fully integrated 4 throw tuning switch designed for high power tunable antenna and filter applications based on GaN technology. The TS63430D supports applications spanning 30 MHz through 1 GHz, providing low R_{ON} and high linearity within a small package size. The TS63430D is a 50 W CW with peak voltage capability of 100 V, switch suitable for applications requiring low insertion loss, high isolation, and high linearity. TS63430D utilizes standard single V_{DD}, no extra negative voltage needed, neither high voltages.

The TS63430D is packaged into a compact Quad Flat No lead (QFN) 6.0x3.0 mm^2 32 leads plastic package.

RoHS

RoHS/Reach/Halogen free

Absolute Maximum Ratings

Table 1: Absolute Maximum Ratings $T_A = +25$°C unless otherwise specified[1].

Parameter	Symbol	Value	Unit
Electrical Ratings			
Power Supply Voltage	V_{DD}	5.5	V
Storage Temperature Range	T_{st}	-55...+125	°C
Operating Temperature Range	T_{op}	-40...+85	°C
Maximum Junction Temperature	T_j	+140	°C
Maximum RF CW input power	RFxI/RFxO	49	dBm
Maximum RF peak input power, 1% duty cycle, 10μs pulse	RFxI/RFxO	tbd	dBm
Maximum RF peak voltage	RFxI/RFxO	110	V
Thermal Ratings			
Thermal Resistance (junction-to-case) – Bottom side	$R_{\theta jc}$	tbd	°C/W
Thermal Resistance (junction-to-top)	$R_{\theta jt}$	tbd	°C/W
Soldering Temperature	T_{solder}	+260	°C
ESD Ratings			
Human Body Model (HBM)	Level 1B	500...<1000	V
Charged Device Model (CDM)	Level C3	≥1000	V
Moisture Rating			
Moisture Sensitivity Level	MSL	1	

[1] Maximum ratings are absolute ratings. Exposure to absolute maximum rating conditions for extended periods may affect device reliability and can cause permanent damage to the device. Exceeding one or a combination of the absolute maximum ratings may cause permanent and irreversible damage to the device and/or to surrounding circuit. Functional operation of the device is not implied in any conditions above those indicated in the Electrical Specifications section.

Electrical Specifications

Table 2: Electrical Specifications $T_A = +25°C; V_{DD} = +3.3V; 50\Omega$ Source/Load.

Parameter	Condition	Minimum	Typical	Maximum	Unit
Operating frequency	f	30		1000	MHz
ON Resistance	R_{ON}		0.50		Ω
OFF Capacitance	C_{OFF}		500		fF
Insertion loss	50 MHz		0.08		dB
	500 MHz		0.10		dB
RFxI – RFxO	1000 MHz		0.13		dB
Isolation	50 MHz		36		dB
	500 MHz		17		dB
RFxI – RFxO	1000 MHz		11		dB
Return Loss	50 MHz		-42		dB
	500 MHz		-37		dB
RFxI – RFxO	1000 MHz		-36		dB

Table 3: Electrical Specifications $T_A = +25°C; V_{DD} = +3.3V; 50\Omega$ Source/Load.

Parameter	Condition	Minimum	Typical	Maximum	Unit
Operating frequency	f	30		1000	MHz
Harmonic Distortion					
H_2	800MHz, P_{in} =35dBm		115		dBc
H_3	800MHz, P_{in} =35dBm		111		dBc
IIP3	800MHz		74		dBm
Power and Compression point					
P_{maxCW}	Max RF CW Power		48		dBm
P_{maxpeak}	Max RF Peak Power 1% duty cycle		tbd		dBm
Noise					
CP switching noise	RBW=1kHz		-140		dBm
Switching Time					
t_{ON} [1]	Switch ON time		5.9		μs
t_{OFF} [1]	Switch OFF time		5.9		μs
t_{RISE}	Switch RISE time		tbd		μs
t_{FALL}	Switch FALL time		tbd		μs
t_{startup}, $C_{VCP} = 1$nF	startup time		0.8		ms
Power Supply, DC					
Control voltage	Power Supply V_{DD}	2.6	3.3	5.25	V
	All control pins high, V_{ih}	1.0	3.3	5.25	V
	All control pins low, V_{il}	-0.3	0	0.5	V
Control current	All control pins high, I_{ih}			7.5	μA
	All control pins low, I_{il}		0		μA
Current consumption	I_{DD}, active mode (V_{DD} on)		220		μA

[1] This switching time is complete switching time. Many industry solutions require external biasing and control circuitry, which is not taken into account in switching time. TS63430D switching time definition includes time of the internal biasing and control circuitry.

Legal Information

Published by

TagoreTech Inc.
601 Campus Drive, Suite C1
Arlington Heights, IL 60004, USA

Legal Disclaimer

The information provided in this document shall in no event be regarded as a guarantee of conditions or characteristics. TagoreTech assumes no responsibility for the consequences of the use of this information, nor for any infringement of patents or of other rights of third parties which may result from the use of this information. No license is granted by implication or otherwise under any patent or patent rights of TagoreTech. The specifications mentioned in this document are subject to change without notice. Errors and omissions excepted.

Sales Contact

Engineering samples available only thru TagoreTech sales, please contact: support@tagoretech.com.

TS63430D Product Page

Please visit TS63430D product page for further information TS63430D Product Page

Latest datasheet of TS63430D

Latest version of TS63430D product brief is available for download: TS63430D Product Brief

TS63430D Datasheet Link will work once datasheet published.

TagoreTech Inc. Product Brochure and datasheets

Tagore Product Brochure and links to all available datasheets is available for download

TagoreTech Product Brochure

Changelog

Table 4: Changelog

Date	Revision	Notes
09/20/2025	0.1	Product Brief Published