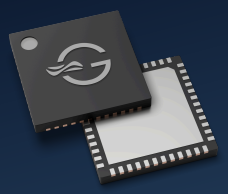
TAGORE

GaN SP4T RF power switch · also as TS85410L (charge pump off)

TS8541L

A GaN SP4T power switch for 50 W from 1 MHz to 4.3 GHz in one 4 × 4 mm chip, with 125 W peak.



50 W
CW power (125 W peak)

4 paths
Single pole four throw

0.16 dB
Insertion loss at 30 MHz

60 dB
Isolation at 30 MHz

What it does for your design

- **Four paths at 50 W.** Antenna, band or filter selection at real transmit power in 4 × 4 mm.
- **Fewer parts, low power signature.** PIN diode switches need a large bill of materials to generate their bias, and that bias draws power. Here it is built in, under 1 mW: ideal for secure communications that need a low power signature.
- **Fast switching.** About 0.9 µs.
- **Ultra-quiet option.** The TS85410L is the same switch with the charge pump off and an external −18 V supply.
- **Use the supply you already have.** One 3.3 V or 5 V rail. No negative supply and no DC blocking capacitors.
- **Matches to your band.** Unmatched up to 2.7 GHz, with matching examples up to 4.3 GHz.

Key specifications

Parameter	Typical
Frequency range	1 MHz – 4.3 GHz
Insertion loss	0.16 dB @ 30 MHz · 0.30 dB @ 1 GHz
Isolation	60 dB @ 30 MHz · 37 dB @ 1 GHz
Power handling	50 W CW · 125 W peak
Supply	2.6 – 5.25 V, no negative supply
Control	CMOS
Switching time	0.9 µs (t_{ON})
Package	32-pin QFN, 4.0 × 4.0 mm

Built for

Private mobile and defence radios · Public safety handsets · Cellular infrastructure · Satellite terminals · Datalinks

Why move from PIN diodes

A typical 50 W PIN diode SP4T today
Dozens of parts, a high-voltage bias supply and power drawn all the time.

With the TS8541L
One 4 × 4 mm chip and one low-voltage supply, under 1 mW.

Choose the right switch for your design

Part (click for datasheet)	Type	Power (CW)	Frequency	Package
TS8541L ↗ / TS85410L ↗	**SP4T**	**50 W**	**1 MHz – 4.3 GHz**	**QFN 4 × 4**
TS8546L ↗	SP4T	50 W	1 MHz – 4.5 GHz, ESD	QFN 4 × 4
TS8441L ↗ / TS84410L ↗	SP4T	30 W	1 MHz – 5.0 GHz	QFN 4 × 4
TS8043N ↗ / TS80430N ↗	SP4T	100 W	1 MHz – 3.0 GHz	QFN 5 × 5

Need four paths at 50 W? Choose the **TS8541L**. Need ESD protection? Choose the TS8546L. Need 100 W? Choose the TS8043N.

Part numbers with an extra 0 have the charge pump disabled for ultra-quiet operation and need an external −18 V bias supply.

Get started

STEP 1
Read the datasheet
Scan the code or visit
tagoretech.com/Product_Doc/TS8541L.pdf

STEP 2
Order samples
TS8541L
TS85410L · charge pump off
TS8541L-EVB · evaluation board
From DigiKey, Richardson RFPD or your TagoreTech representative.

STEP 3
Talk to an expert
Our applications team will help you design it in.
support@tagoretech.com

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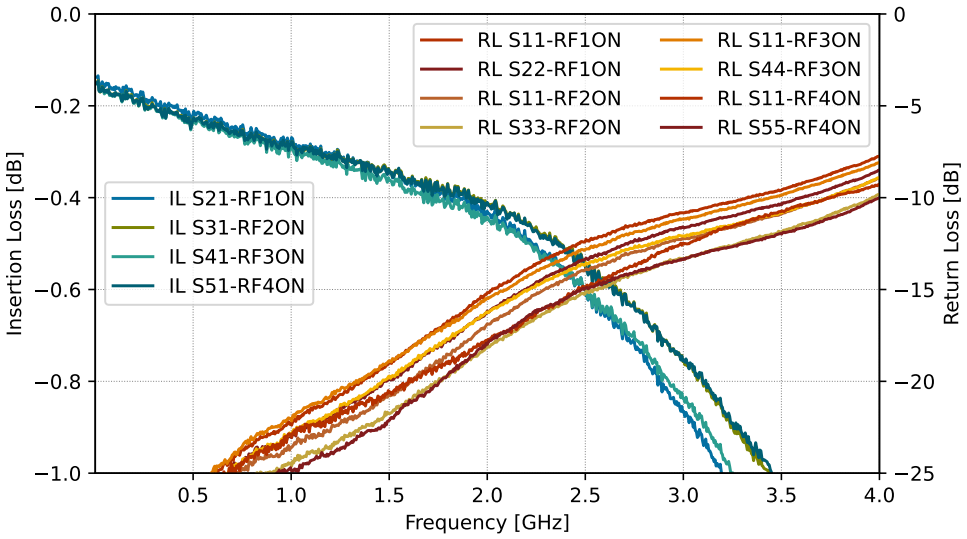
Typical performance

Measured curves from the TS8541L datasheet, T_A = 25 °C, 50 Ω. The TS85410L has the same RF performance.

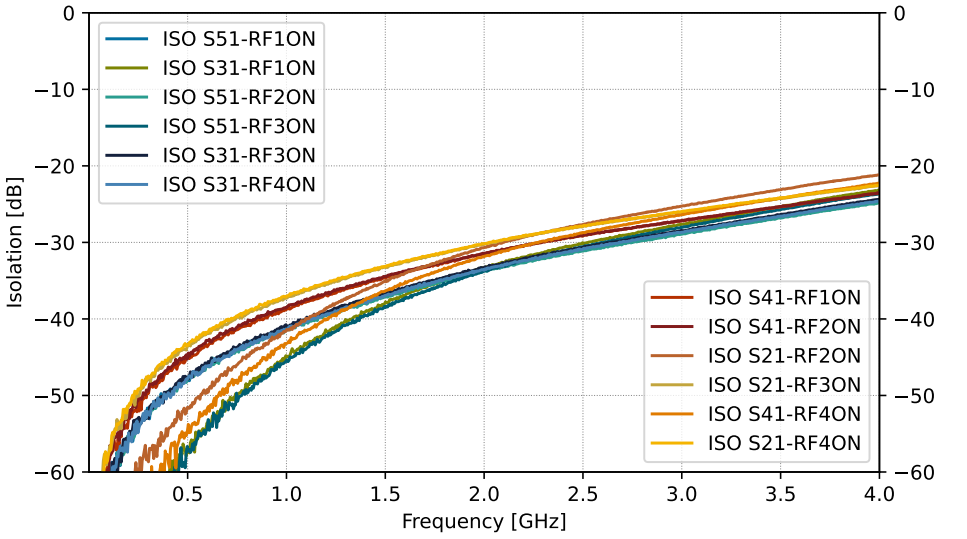
Insertion loss and return loss

RFC to RFx, unmatched



Isolation

RFC to the off ports



Typical values

Parameter	30 MHz	1 GHz	2 GHz	2.7 GHz
Insertion loss, unmatched (dB)	0.16	0.30	0.45	0.70
Isolation (dB)	60	37	30	27

Full data, S-parameters and evaluation board details in the datasheet at tagoretech.com/Product_Doc/TS8541L.pdf.

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