

# Application Clip

Standard Linear and Logic

## High-Speed 10/100 Base-T Switching With the TS5L100 and TS3L100 LAN Switches

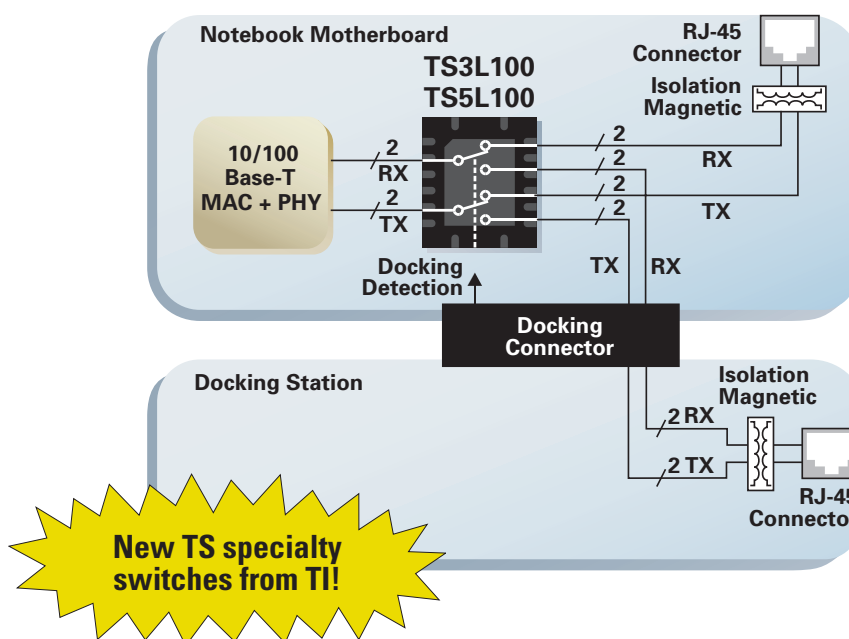
The Texas Instruments (TI) TS5L100 and TS3L100 are local area network (LAN) multiplexers from TI's specialty switch portfolio. They are specifically designed to route 10/100 base-T Ethernet signals. The major difference between these two multiplexers is the TS3L100 operates from a standard 3.3-V supply, and the TS5L100 operates from an easily implemented 6.2-V supply.

In the LAN application shown here, the TS3L100 or TS5L100 is used to switch the 10/100 base-T Ethernet differential signals directly between the docking station (through the docking connector) and the laptop computer. Mating the laptop to the docking station flags a detection signal to switch the TS3L100 or TS5L100 automatically to accept the differential pair Ethernet signals from the docking station.

Prior mobile computing designs entailed placing an Ethernet Media Access Controller (MAC) and an Ethernet Physical Layer (PHY) device on the docking station. This

redundant circuitry unnecessarily increased total system cost, as it can be replaced quite efficiently with a LAN switch from TI without sacrificing signal quality.

### High-Speed 10/100 Base-T Ethernet Switches Available From Texas Instruments

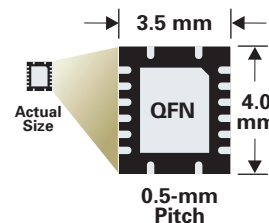


### TI LAN Specialty Switches

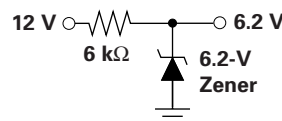
Key Features	TS3L100	TS5L100	Benefits
$r_{on}$ flatness	4 $\Omega$ typ. (0 V < $V_{IN}$ < 3.3 V)	8 $\Omega$ typ. (0 V < $V_{IN}$ < 4.5 V)	Maintains good signal quality at frequencies up to 350 MHz
$\Delta r_{on}$	1 $\Omega$ typ.	1 $\Omega$ typ.	Low skew between channels
High off-isolation	-42 dB typ.	-40 dB typ.	Excellent isolation at high frequencies when LAN switch is open
Low differential crosstalk	-55 dB typ.	-60 dB typ.	Excellent isolation between channels to prevent unwanted interference
Supply voltage range	3.0 to 3.6 V	—	Low-voltage operation
	—	6.0 to 6.5 V*	Improved performance over 4.5-V input signal
Space-saving QFN package	Yes	Yes	Smallest 'L100 LAN switch available today
$I_{CC}$	3 $\mu$ A max.	3 $\mu$ A max.	Ideal for laptop computing

\*The TS5L100 requires a 6.2-V supply to provide a better on-resistance performance. 6.2 V can be generated by tapping off between a 6-k $\Omega$  resistor and a 6.2-V Zener (the other end of the resistor can be tied to the 12-V supply and the anode of the Zener diode to ground).

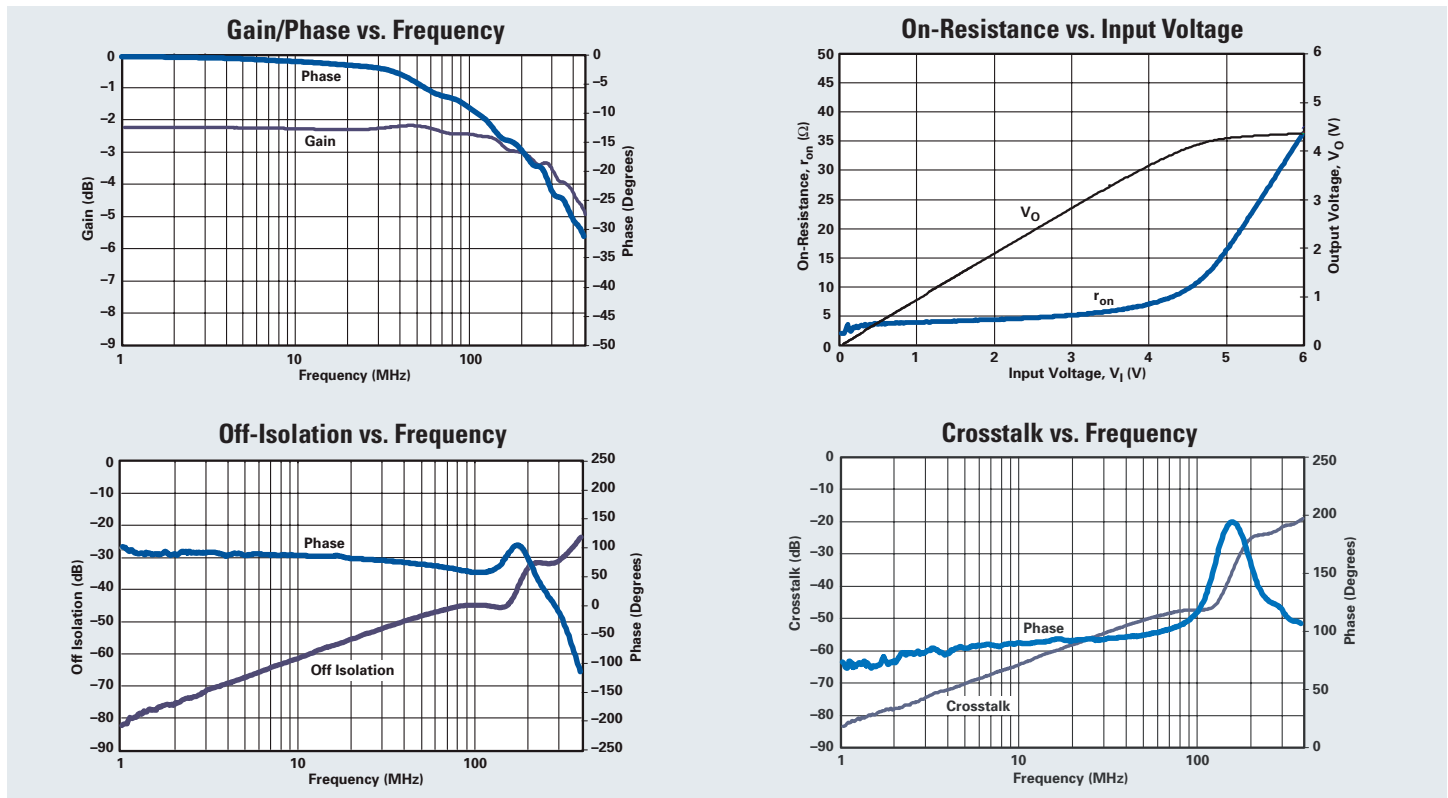
Available in the small space-saving QFN package!



### Basic 6.2-V Supply



## Typical Characteristics of the TS5L100

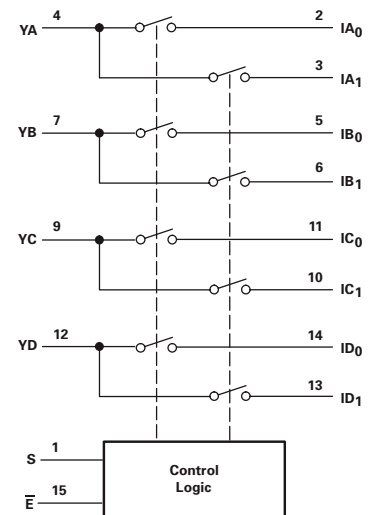


## Ordering Information

Package*			Orderable Part Number	Top-Side Marking
JEDEC	TI	Carrier		
QFN	RGY	Tape and reel	TS3L100RGYR	TK100
SOIC	D	Tube	TS3L100D	TS3L100
		Tape and reel	TS3L100DR	
SSOP (QSOP)	DBQ	Tape and reel	TS3L100DBQR	TK100
TSSOP	PW	Tube	TS3L100PW	TK100
		Tape and reel	TS3L100PWR	
TVSOP	DGV	Tape and reel	TS3L100DGV	TK100
QFN	RGY	Tape and reel	TS5L100RGYR	TG100
SOIC	D	Tube	TS5L100D	TS5L100
		Tape and reel	TS5L100DR	
SSOP (QSOP)	DBQ	Tape and reel	TS5L100DBQR	TG100
TSSOP	PW	Tube	TS5L100PW	TG100
		Tape and reel	TS5L100PWR	
TVSOP	DGV	Tape and reel	TS5L100DGV	TG100

\*Package drawings, standard packing quantities, thermal data, symbolization and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package)

## TS5L100 Functional Diagram



## For More Information

Product Folders:

[focus.ti.com/docs/prod/folders/print/ts51100.html](http://focus.ti.com/docs/prod/folders/print/ts51100.html)

[focus.ti.com/docs/prod/folders/print/ts31100.html](http://focus.ti.com/docs/prod/folders/print/ts31100.html)

Datasheets:

[focus.ti.com/lit/ds/symlink/ts51100.pdf](http://focus.ti.com/lit/ds/symlink/ts51100.pdf)

[focus.ti.com/lit/ds/symlink/ts31100.pdf](http://focus.ti.com/lit/ds/symlink/ts31100.pdf)

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