

0.75-Ω DUAL SPDT ANALOG SWITCH WITH INPUT LOGIC TRANSLATION

Check for Samples: [TS5A26542](#)

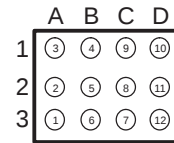
FEATURES

- Specified Break-Before-Make Switching
- Low ON-State Resistance (0.75 Ω Max)
- Control Inputs Reference to V_{IO}
- Low Charge Injection
- Excellent ON-State Resistance Matching
- Low Total Harmonic Distortion (THD)
- 2.25-V to 5.5-V Power Supply (V_+)
- 1.65-V to 1.95-V Logic Supply (V_{IO})
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Performance Tested Per JESD 22
 - 2000-V Human-Body Model (A114-B, Class II)
 - 1000-V Charged-Device Model (C101)
 - 300-V Machine Model (A115-A)
- COM Inputs
 - 8000-V Human-Body Model (A114-B, Class II)
 - ±15-kV Contact Discharge (IEC 61000-4-2)

APPLICATIONS

- Cell Phones
- PDAs
- Portable Instrumentation

YZT PACKAGE⁽¹⁾
(BOTTOM VIEW)


⁽¹⁾The GND balls are internally connected.

	A	B	C	D
1	IN1	NO1	COM1	NC1
2	VIO	GND	GND	V+
3	IN2	NO2	COM2	NC2

DESCRIPTION

The TS5A26542 is a dual single-pole double-throw (SPDT) analog switch that is designed to operate from 2.25 V to 5.5 V. The device offers a low ON-state resistance with an excellent channel-to-channel ON-state resistance matching, and the break-before-make feature to prevent signal distortion during the transferring of a signal from one path to the another. The device has excellent total harmonic distortion (THD) performance and consumes very low power. These features make this device suitable for portable audio applications.

The TS5A26542 has a separate logic supply pin (V_{IO}) that operates from 1.65 V to 1.95 V. V_{IO} powers the control circuitry, which allows the TS5A26542 to be controlled by 1.8-V signals.

Table 1. ORDERING INFORMATION

T_A	PACKAGE ⁽¹⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING ⁽²⁾
–40°C to 85°C	NanoFree™ – WCSP (DSBGA) 0.23-mm Large Bump – YZT (Pb-free) 0.625-mm max height	Reel of 3000	TS5A26542YZTR	_ _ _ JN _

- (1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at [www.ti.com](#).
- (2) YZT: The actual top-side marking has three preceding characters to denote year, month, and sequence code, and one following character to designate the assembly/test site. Pin 1 identifier indicates solder-bump composition (1 = SnPb, • = Pb-free).



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

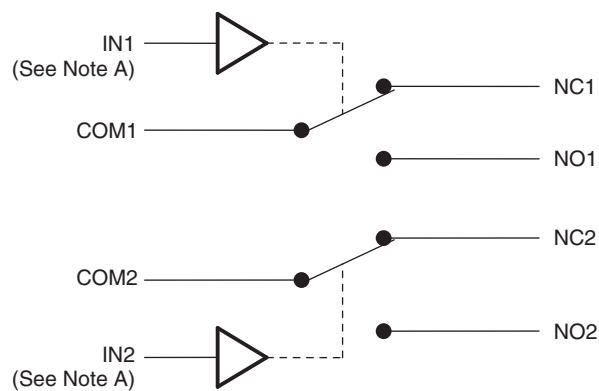
NanoFree is a trademark of Texas Instruments.

SUMMARY OF CHARACTERISTICS⁽¹⁾

Configuration	2:1 Multiplexer/Demultiplexer (2 × SPDT)
Number of channels	2
ON-state resistance (r_{on})	0.75 Ω max
ON-state resistance match (Δr_{on})	0.1 Ω max
ON-state resistance flatness ($r_{on(Flat)}$)	0.1 Ω max
Turn-on/turn-off time (t_{ON}/t_{OFF})	25 ns/20 ns
Charge injection (Q_C)	15 pC
Bandwidth (BW)	43 MHz
OFF isolation (O_{ISO})	–63 dB at 1 MHz
Crosstalk (X_{TALK})	–63 dB at 1 MHz
Total harmonic distortion (THD)	0.004%
Leakage current ($I_{NO(OFF)}/I_{NC(OFF)}$)	20 nA
Package option	12-pin WCSP

(1) $V_+ = 5\text{ V}$, $T_A = 25^\circ\text{C}$ **FUNCTION TABLE**

IN	NC TO COM, COM TO NC	NO TO COM, COM TO NO
L	ON	OFF
H	OFF	ON

LOGIC DIAGRAMA. IN1 and IN2 are control inputs referenced to V_{IO} .

ABSOLUTE MAXIMUM RATINGS^{(1) (2)}

over operating free-air temperature range (unless otherwise noted)

			MIN	MAX	UNIT
V_+ V_{IO}	Supply voltage range ⁽³⁾		–0.5	6.5	V
V_{NC} V_{NO} V_{COM}	Analog voltage range ^{(3) (4) (5)}		–0.5	$V_+ + 0.5$	V
$I_{I/OK}$	Analog port diode current	$V_{NO}, V_{NC}, V_{COM} < 0$ or $V_{NO}, V_{NC}, V_{COM} > V_+$	–50	50	mA
I_{NC} I_{NO} I_{COM}	ON-state switch current	$V_{NO}, V_{NC}, V_{COM} = 0$ to V_+	–450	450	mA
	ON-state peak switch current ⁽⁶⁾		–700	700	
V_I	Digital input voltage range ^{(3) (4)}		–0.5	6.5	V
I_{IK}	Digital input clamp current	$V_I < 0$	–50		mA
I_+ I_{GND}	Continuous current through V_+ or GND		–100	100	mA
θ_{JA}	Package thermal impedance ⁽⁷⁾			102	°C/W
T_{stg}	Storage temperature range		–65	150	°C

- (1) Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The algebraic convention, whereby the most negative value is a minimum and the most positive value is a maximum
- (3) All voltages are with respect to ground, unless otherwise specified.
- (4) The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
- (5) This value is limited to 5.5 V maximum.
- (6) Pulse at 1-ms duration <10% duty cycle
- (7) The package thermal impedance is calculated in accordance with JESD 51-7.

ELECTRICAL CHARACTERISTICS FOR 5-V SUPPLY⁽¹⁾
 $V_+ = 4.5\text{ V to }5.5\text{ V}$, $V_{IO} = 1.65\text{ V to }1.95\text{ V}$, $T_A = -40^\circ\text{C to }85^\circ\text{C}$ (unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS		T _A	V ₊	MIN	TYP	MAX	UNIT
Analog Switch									
Analog signal range	V _{COM} , V _{NO}					0		V ₊	V
ON-state resistance	r _{on}	V _{NO} or V _{NC} = 2.5 V, I _{COM} = −100 mA,	Switch ON, See Figure 14	25°C Full	4.5 V	0.5	0.75 0.8		Ω
ON-state resistance match between channels	Δr _{on}	V _{NO} or V _{NC} = 2.5 V, I _{COM} = −100 mA,	Switch ON, See Figure 14	25°C Full	4.5 V	0.05	0.1 0.1		Ω
ON-state resistance flatness	r _{on(flat)}	0 ≤ (V _{NO} or V _{NC}) ≤ V ₊ , I _{COM} = −100 mA,	Switch ON, See Figure 14	25°C	4.5 V	0.1			Ω
		V _{NO} or V _{NC} = 1 V, 1.5 V, 2.5 V, I _{COM} = −100 mA,	Switch ON, See Figure 14	25°C		0.1	0.25		
				Full			0.25		
NO, NC OFF leakage current	I _{NO(OFF)} , I _{NC (OFF)}	V _{NO} = 1 V, 4.5 V, V _{COM} = 4.5 V, 1 V, V _{NC} = Open, or V _{NC} = 1 V, 4.5 V, V _{COM} = 4.5 V, 1 V, V _{NO} = Open,	Switch OFF, See Figure 15	25°C Full	5.5 V	−20 −100	2 100	20	nA
NC, NO ON leakage current	I _{NO(ON)}	V _{NO} = 1 V, 4.5 V, V _{NC} and V _{COM} = Open, or V _{NC} = 1V, 4.5 V, V _{NO} and V _{COM} = Open,	Switch ON, See Figure 16	25°C Full	5.5 V	−20 −200	2 200	20	nA
COM ON leakage current	I _{COM(ON)}	V _{COM} = 1 V, V _{NO} and V _{NC} = Open, or V _{COM} = 4.5 V, V _{NO} and V _{NC} = Open,	See Figure 16	25°C Full	5.5 V	−20 −200	2 200	20	nA
Digital Control Inputs (IN1, IN2) ⁽²⁾									
Input logic high	V _{IH}	V _{IO} = 1.65 V to 1.95 V		Full		0.65 × V _{IO}		V _{IO}	V
Input logic low	V _{IL}	V _{IO} = 1.65 V to 1.95 V		Full		0	0.35 × V _{IO}		V
Input leakage current	I _{IH} , I _{IL}	V _I = V _{IO} or 0		25°C Full	5.5 V	−2 −20	2 20		nA

(1) The algebraic convention, whereby the most negative value is a minimum and the most positive value is a maximum

(2) All unused digital inputs of the device must be held at V_{IO} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

ELECTRICAL CHARACTERISTICS FOR 5-V SUPPLY⁽¹⁾ (continued)
 $V_+ = 4.5 \text{ V to } 5.5 \text{ V}$, $V_{IO} = 1.65 \text{ V to } 1.95 \text{ V}$, $T_A = -40^\circ\text{C to } 85^\circ\text{C}$ (unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS		T _A	V+	MIN	TYP	MAX	UNIT
Dynamic									
Turn-on time	t _{ON}	V _{COM} = V ₊ , R _L = 50 Ω,	C _L = 35 pF, See Figure 18	25°C	5 V	1	12.5	25	ns
				Full	4.5 V			30	
Turn-off time	t _{OFF}	V _{COM} = V ₊ , R _L = 50 Ω,	C _L = 35 pF, See Figure 18	25°C	5 V	1	9.5	20	ns
				Full	4.5 V			25	
Break-before-make time	t _{BBM}	V _{NC} = V _{NO} = V ₊ /2, R _L = 50 Ω,	C _L = 35 pF, See Figure 19	25°C	5 V	1	5	10	ns
				Full	4.5 V	1		12	
Charge injection	Q _C	V _{GEN} = 0, R _{GEN} = 0,	C _L = 1 nF, See Figure 23	25°C	5 V		15		pC
NO OFF capacitance	C _{NO(OFF)}	V _{NO} = V ₊ or GND, Switch OFF,	See Figure 17	25°C	5 V		37		pF
NC, NO ON capacitance	C _{NC(ON)} , C _{NO(ON)}	V _{NC} or V _{NO} = V ₊ or GND, Switch ON,	See Figure 17	25°C	5 V		130		pF
COM ON capacitance	C _{COM(ON)}	V _{COM} = V ₊ or GND, Switch ON,	See Figure 17	25°C	5 V		130		pF
Digital input capacitance	C _I	V _I = V _{IO} or GND,	See Figure 17	25°C	5 V		6.5		pF
Bandwidth	BW	R _L = 50 Ω, Switch ON,	See Figure 20	25°C	5 V		43		MHz
OFF isolation	O _{ISO}	R _L = 50 Ω, f = 1 MHz,	See Figure 21	25°C	5 V		–63		dB
Crosstalk	X _{TALK}	R _L = 50 Ω, f = 1 MHz,	See Figure 22	25°C	5 V		–63		dB
Total harmonic distortion	THD	R _L = 600 Ω, C _L = 50 pF,	f = 20 Hz to 20 kHz, See Figure 24	25°C	5 V		0.004		%
Supply									
Positive supply current	I ₊	V _I = V _{IO} or GND		25°C	5.5 V		5.5	100	nA
				Full				750	

(1) The algebraic convention, whereby the most negative value is a minimum and the most positive value is a maximum

Electrical Characteristics for 3.3-V Supply⁽¹⁾

$V_+ = 3\text{ V}$ to 3.6 V , $V_{IO} = 1.65\text{ V}$ to 1.95 V , $T_A = -40^\circ\text{C}$ to 85°C (unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A	V_+	MIN	TYP	MAX	UNIT
Analog Switch								
Analog signal range	V_{COM}, V_{NO}				0		V_+	V
ON-state resistance	r_{on}	V_{NO} or $V_{NC} = 2\text{ V}$, $I_{COM} = -100\text{ mA}$, Switch ON, See Figure 14	25°C Full	3 V	0.75		0.9 1.2	Ω
ON-state resistance match between channels	Δr_{on}	V_{NO} or $V_{NC} = 2\text{ V}$, 0.8 V , $I_{COM} = -100\text{ mA}$, Switch ON, See Figure 14	25°C Full	3 V	0.1		0.15 0.15	Ω
ON-state resistance flatness	$r_{on(flat)}$	$0 \leq (V_{NO} \text{ or } V_{NC}) \leq V_+$, $I_{COM} = -100\text{ mA}$, Switch ON, See Figure 14	25°C Full	3 V	0.2 0.1		0.3 0.3	Ω
NO, NC OFF leakage current	$I_{NO(OFF)}, I_{NC(OFF)}$	$V_{NO} = 1\text{ V}$, 3 V , $V_{COM} = 3\text{ V}$, 1 V , $V_{NC} = \text{Open}$, or $V_{NC} = 1\text{ V}$, 3 V , $V_{COM} = 3\text{ V}$, 1 V , $V_{NO} = \text{Open}$, Switch OFF, See Figure 15	25°C Full	3.6 V	-20 -50	2	20 50	nA
NC, NO ON leakage current	$I_{NO(ON)}$	$V_{NO} = 1\text{ V}$, 3 V , V_{NC} and $V_{COM} = \text{Open}$, or $V_{NC} = 1\text{ V}$, 3 V , V_{NO} and $V_{COM} = \text{Open}$, Switch ON, See Figure 16	25°C Full	3.6 V	-10 30	2	10 30	nA
COM ON leakage current	$I_{COM(ON)}$	$V_{COM} = 1\text{ V}$, V_{NO} and $V_{NC} = \text{Open}$, or $V_{COM} = 3\text{ V}$, V_{NO} and $V_{NC} = \text{Open}$, See Figure 16	25°C Full	3.6 V	-10 -30	2	10 30	nA
Digital Control Inputs (IN1, IN2)⁽²⁾								
Input logic high	V_{IH}	$V_{IO} = 1.65\text{ V}$ to 1.95 V	Full		$0.65 \times V_{IO}$		V_{IO}	V
Input logic low	V_{IL}	$V_{IO} = 1.65\text{ V}$ to 1.95 V	Full		0		$0.35 \times V_{IO}$	V
Input leakage current	I_{IH}, I_{IL}	$V_I = V_{IO}$ or 0	25°C Full	3.6 V	-2 -20		2 20	nA

(1) The algebraic convention, whereby the most negative value is a minimum and the most positive value is a maximum

(2) All unused digital inputs of the device must be held at V_{IO} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

ELECTRICAL CHARACTERISTICS FOR 3.3-V SUPPLY⁽¹⁾ (continued)
 $V_+ = 3\text{ V to }3.6\text{ V}$, $V_{IO} = 1.65\text{ V to }1.95\text{ V}$, $T_A = -40^\circ\text{C to }85^\circ\text{C}$ (unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS		T _A	V+	MIN	TYP	MAX	UNIT
Dynamic									
Turn-on time	t _{ON}	V _{COM} = V ₊ , R _L = 50 Ω,	C _L = 35 pF, See Figure 18	25°C	3.3 V	5	15	30	ns
				Full	3 V	3		35	
Turn-off time	t _{OFF}	V _{COM} = V ₊ , R _L = 50 Ω,	C _L = 35 pF, See Figure 18	25°C	3.3 V	1	9	20	ns
				Full	3 V	1		25	
Break-before-make time	t _{BBM}	V _{NC} = V _{NO} = V ₊ /2, R _L = 50 Ω,	C _L = 35 pF, See Figure 19	25°C	3.3 V	1	8	13	ns
				Full	3 V	1		15	
Charge injection	Q _C	V _{GEN} = 0, R _{GEN} = 0,	C _L = 1 nF, See Figure 23	25°C	3.3 V		6.5		pC
NO OFF capacitance	C _{NO(OFF)}	V _{NO} = V ₊ or GND, Switch OFF,	See Figure 17	25°C	3.3 V		38		pF
NC, NO ON capacitance	C _{NC(ON)} , C _{NO(ON)}	V _{NC} or V _{NO} = V ₊ or GND, Switch ON,	See Figure 17	25°C	3.3 V		133		pF
COM ON capacitance	C _{COM(ON)}	V _{COM} = V ₊ or GND, Switch ON,	See Figure 17	25°C	3.3 V		133		pF
Digital input capacitance	C _I	V _I = V _{IO} or GND,	See Figure 17	25°C	3.3 V		6.5		pF
Bandwidth	BW	R _L = 50 Ω, Switch ON,	See Figure 20	25°C	3.3 V		42		MHz
OFF isolation	O _{ISO}	R _L = 50 Ω, f = 1 MHz,	See Figure 21	25°C	3.3 V		−63		dB
Crosstalk	X _{TALK}	R _L = 50 Ω, f = 1 MHz,	See Figure 22	25°C	3.3 V		−63		dB
Total harmonic distortion	THD	R _L = 600 Ω, C _L = 50 pF,	f = 20 Hz to 20 kHz, See Figure 24	25°C	3.3 V		0.004		%
Supply									
Positive supply current	I ₊	V _I = V _{IO} or GND	25°C	3.6 V		10	50	nA	
			Full				300		

(1) The algebraic convention, whereby the most negative value is a minimum and the most positive value is a maximum

ELECTRICAL CHARACTERISTICS FOR 2.5-V SUPPLY⁽¹⁾
 $V_+ = 2.25\text{ V to }2.75\text{ V}$, $V_{IO} = 1.65\text{ V to }1.95\text{ V}$, $T_A = -40^\circ\text{C to }85^\circ\text{C}$ (unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS		T _A	V ₊	MIN	TYP	MAX	UNIT
Analog Switch									
Analog signal range	V _{COM} , V _{NO}					0		V ₊	V
ON-state resistance	r _{on}	V _{NO} or V _{NC} = 1.8 V, I _{COM} = −100 mA,	Switch ON, See Figure 14	25°C	2.25 V	1		1.3	Ω
				Full				1.6	
ON-state resistance match between channels	Δr _{on}	V _{NO} or V _{NC} = 1.8 V, 0.8 V, I _{COM} = −100 mA,	Switch ON, See Figure 14	25°C	2.25 V	0.15		0.2	Ω
				Full				0.2	
ON-state resistance flatness	r _{on(flat)}	0 ≤ (V _{NO} or V _{NC}) ≤ V ₊ , I _{COM} = −100 mA,	Switch ON, See Figure 14	25°C	2.25 V	0.5			Ω
				25°C		0.25		0.5	
		V _{NO} or V _{NC} = 0.8 V, 1 V, 1.8 V, I _{COM} = −100 mA,	Switch ON, See Figure 14	Full				0.6	
NO, NC OFF leakage current	I _{NO(OFF)} , I _{NC (OFF)}	V _{NO} = 0.5 V, 2.2 V, V _{COM} = 2.2 V, 0.5 V, V _{NC} = Open, or V _{NC} = 0.5 V, 2.2 V, V _{COM} = 2.2 V, 0.5 V, V _{NO} = Open,	Switch OFF, See Figure 15	25°C	2.75 V	−20	2	20	nA
				Full		−50		50	
NC, NO ON leakage current	I _{NO(ON)}	V _{NO} = 0.5 V, 2.2 V, V _{NC} and V _{COM} = Open, or V _{NC} = 0.5 V, 2.2 V, V _{NO} and V _{COM} = Open,	Switch ON, See Figure 16	25°C	2.75 V	−10	2	10	nA
				Full		−20		20	
COM ON leakage current	I _{COM(ON)}	V _{COM} = 0.5 V, V _{NO} and V _{NC} = Open, or V _{COM} = 2.2 V, V _{NO} and V _{NC} = Open,	Switch ON, See Figure 16	25°C	2.75 V	−10	2	10	nA
				Full		−50		50	
Digital Control Inputs (IN1, IN2) ⁽²⁾									
Input logic high	V _{IH}	V _{IO} = 1.65 V to 1.95 V		Full		0.65 × V _{IO}		V _{IO}	V
Input logic low	V _{IL}	V _{IO} = 1.65 V to 1.95 V		Full		0		0.35 × V _{IO}	V
Input leakage current	I _{IH} , I _{IL}	V _I = V _{IO} or 0		25°C	2.75 V	−2		2	nA
				Full		−20		20	

(1) The algebraic convention, whereby the most negative value is a minimum and the most positive value is a maximum

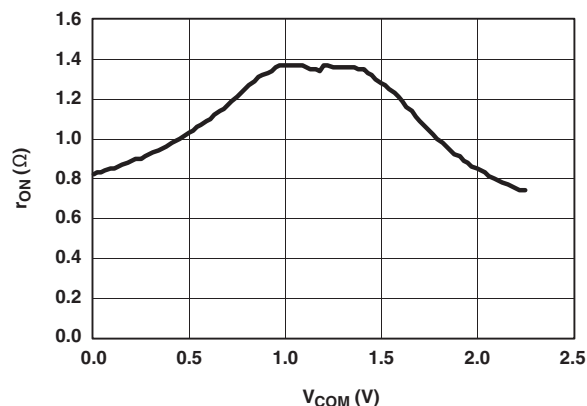
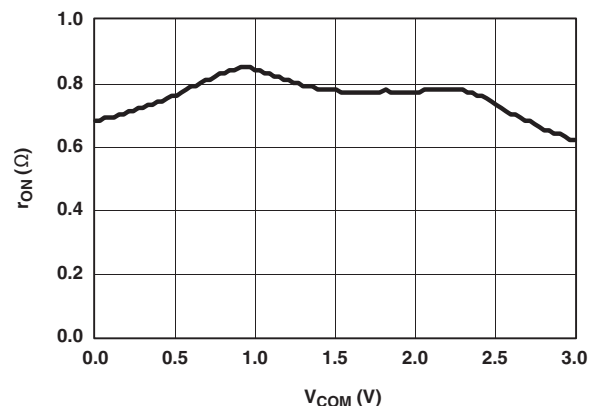
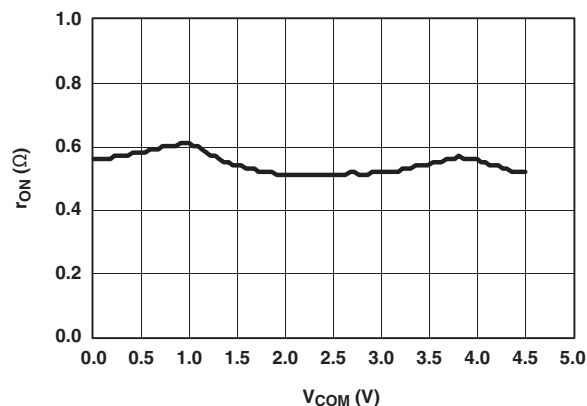
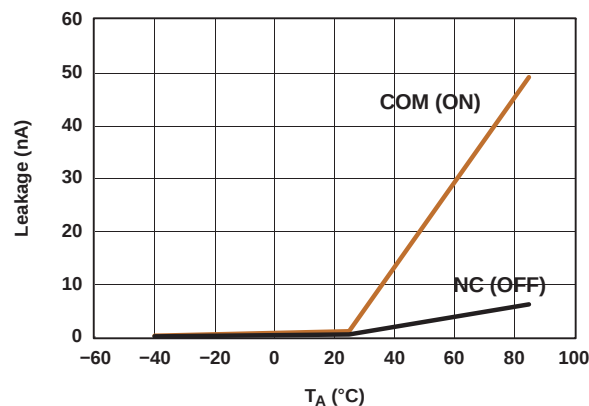
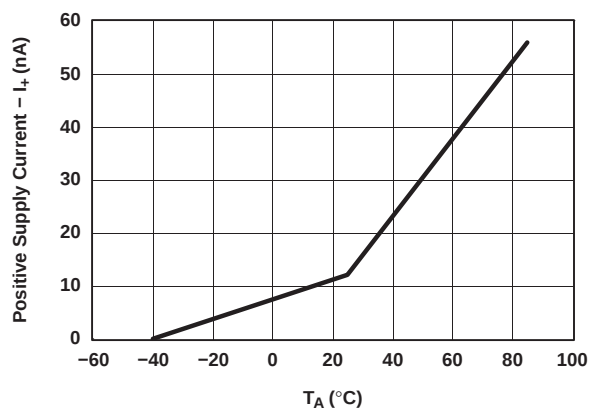
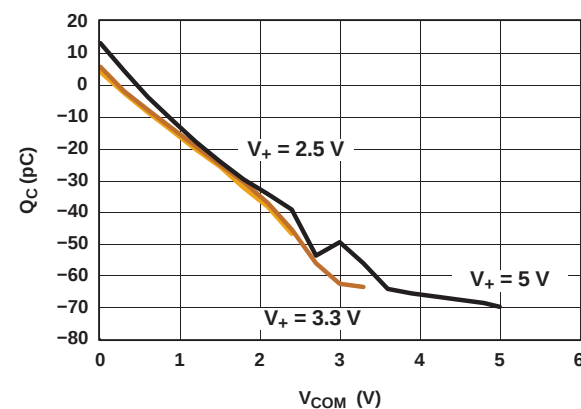
(2) All unused digital inputs of the device must be held at V_{IO} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

ELECTRICAL CHARACTERISTICS FOR 2.5-V SUPPLY⁽¹⁾ (continued)
 $V_+ = 2.25\text{ V to }2.75\text{ V}$, $V_{IO} = 1.65\text{ V to }1.95\text{ V}$, $T_A = -40^\circ\text{C to }85^\circ\text{C}$ (unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS		T _A	V+	MIN	TYP	MAX	UNIT
Dynamic									
Turn-on time	t _{ON}	V _{COM} = V ₊ , R _L = 50 Ω,	C _L = 35 pF, See Figure 18	25°C	2.5 V	5	20	35	ns
				Full	2.25 V	5		40	
Turn-off time	t _{OFF}	V _{COM} = V ₊ , R _L = 50 Ω,	C _L = 35 pF, See Figure 18	25°C	2.5 V	2	10	20	ns
				Full	2.25 V	2		25	
Break-before-make time	t _{BBM}	V _{NC} = V _{NO} = V ₊ /2, R _L = 50 Ω,	C _L = 35 pF, See Figure 19	25°C	2.5 V	1	11	20	ns
				Full	2.25 V	1		25	
Charge injection	Q _C	V _{GEN} = 0, R _{GEN} = 0,	C _L = 1 nF, See Figure 23	25°C	2.5 V		5		pC
NO OFF capacitance	C _{NO(OFF)}	V _{NO} = V ₊ or GND, Switch OFF,	See Figure 17	25°C	2.5 V		38		pF
NC, NO ON capacitance	C _{NC(ON)} , C _{NO(ON)}	V _{NC} or V _{NO} = V ₊ or GND, Switch ON,	See Figure 17	25°C	2.5 V		135		pF
COM ON capacitance	C _{COM(ON)}	V _{COM} = V ₊ or GND, Switch ON,	See Figure 17	25°C	2.5 V		135		pF
Digital input capacitance	C _I	V _I = V _{IO} or GND,	See Figure 17	25°C	2.5 V		6.5		pF
Bandwidth	BW	R _L = 50 Ω, Switch ON,	See Figure 20	25°C	2.5 V		40		MHz
OFF isolation	O _{ISO}	R _L = 50 Ω, f = 1 MHz,	See Figure 21	25°C	2.5 V		−63		dB
Crosstalk	X _{TALK}	R _L = 50 Ω, f = 1 MHz,	See Figure 22	25°C	2.5 V		−63		dB
Total harmonic distortion	THD	R _L = 600 Ω, C _L = 50 pF,	f = 20 Hz to 20 kHz, See Figure 24	25°C	2.5 V		0.008		%
Supply									
Positive supply current	I ₊	V _I = V _{IO} or GND		25°C	2.75 V		10	25	nA
				Full				100	

(1) The algebraic convention, whereby the most negative value is a minimum and the most positive value is a maximum

TYPICAL PERFORMANCE

Figure 1. r_{on} vs V_{COM} ($V_+ = 2.5$ V)Figure 2. r_{on} vs V_{COM} ($V_+ = 3.3$ V)Figure 3. r_{on} vs V_{COM} ($V_+ = 5$ V)Figure 4. Leakage Current vs Temperature ($V_+ = 5$ V)Figure 5. I_+ vs Temperature ($V_+ = 5$ V)Figure 6. Charge Injection (Q_C) vs V_{COM}

TYPICAL PERFORMANCE (continued)

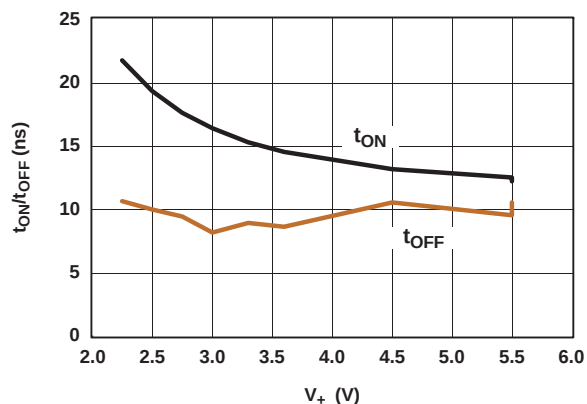


Figure 7. t_{ON}/t_{OFF} vs Supply Voltage

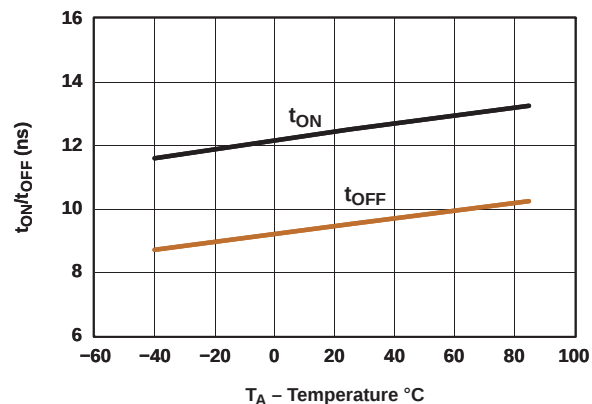


Figure 8. t_{ON}/t_{OFF} vs Temperature ($V_+ = 5$ V)

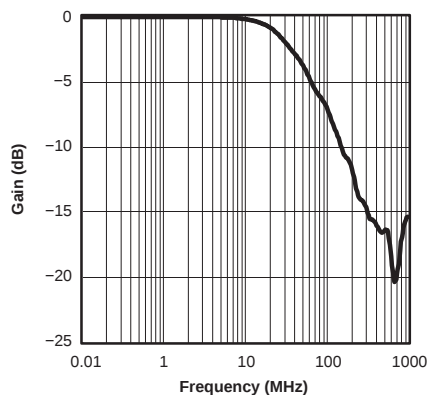


Figure 9. Gain vs Frequency ($V_+ = 5$ V)

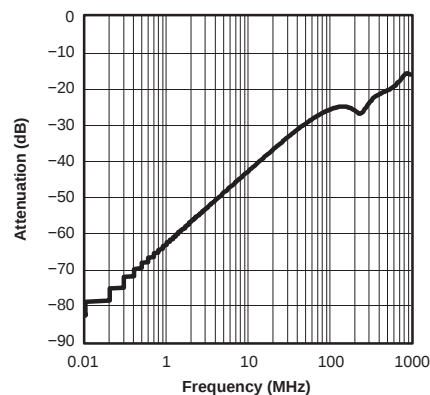


Figure 10. Crosstalk vs Frequency ($V_+ = 5$ V)

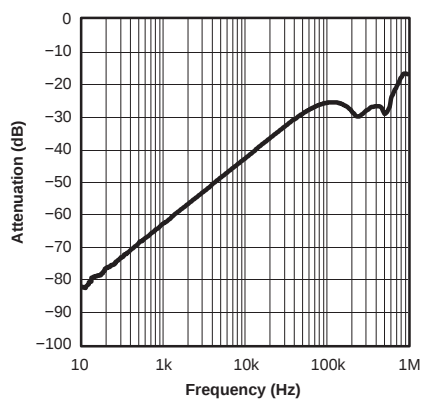


Figure 11. OFF Isolation vs Frequency ($V_+ = 5$ V)

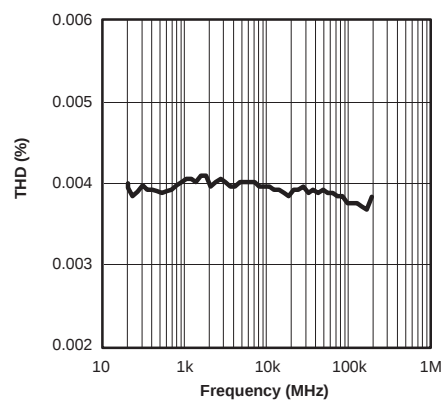
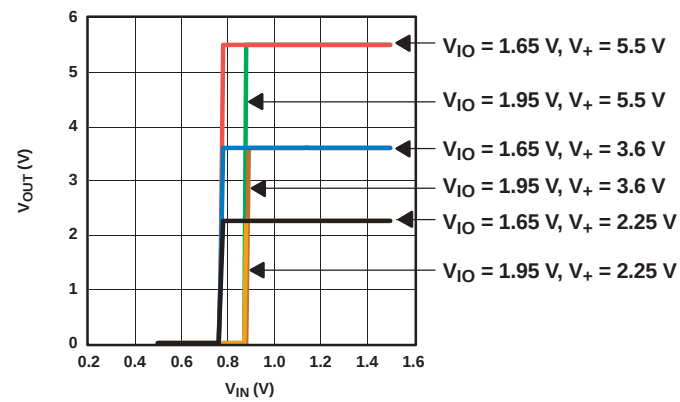


Figure 12. Total Harmonic Distortion vs Frequency ($V_+ = 2.5$ V)

TYPICAL PERFORMANCE (continued)

Figure 13. V_{IO} Thresholds

PARAMETER MEASUREMENT INFORMATION

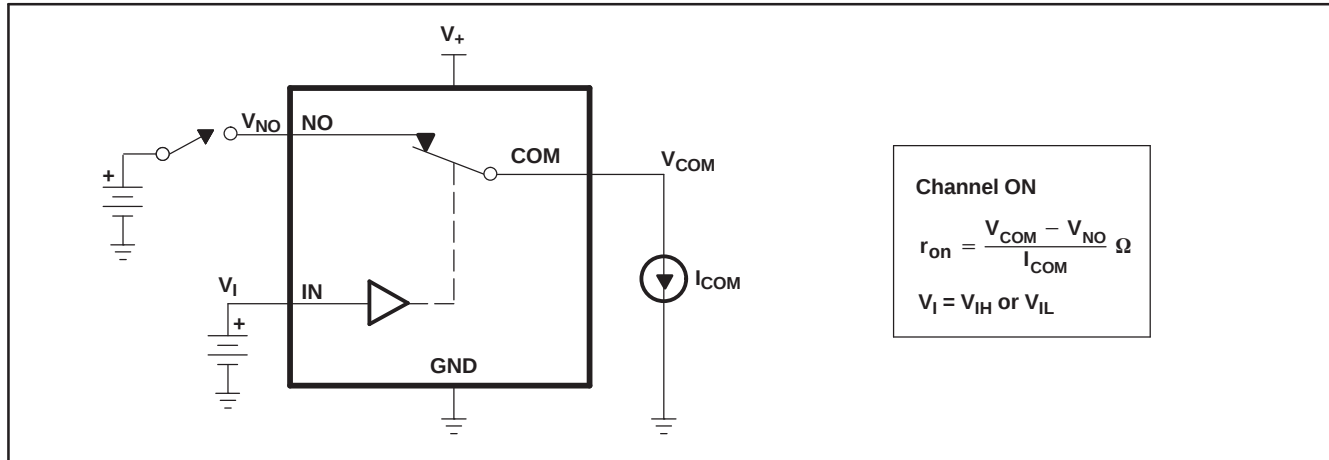


Figure 14. ON-State Resistance (r_{on})

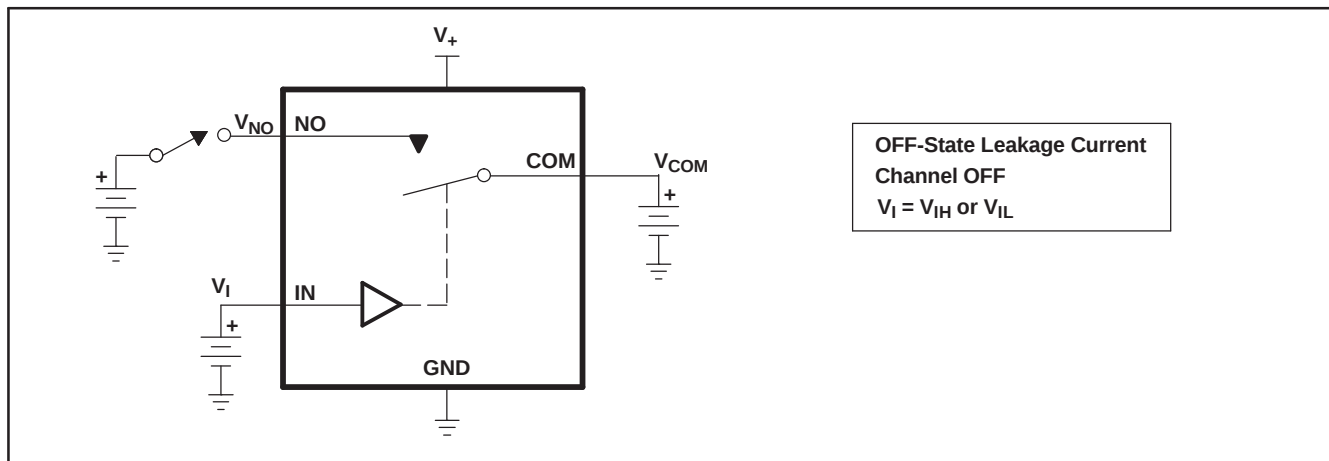


Figure 15. OFF-State Leakage Current ($I_{COM(OFF)}$, $I_{NC(OFF)}$, $I_{COM(PWROFF)}$, $I_{NC(PWRFF)}$)

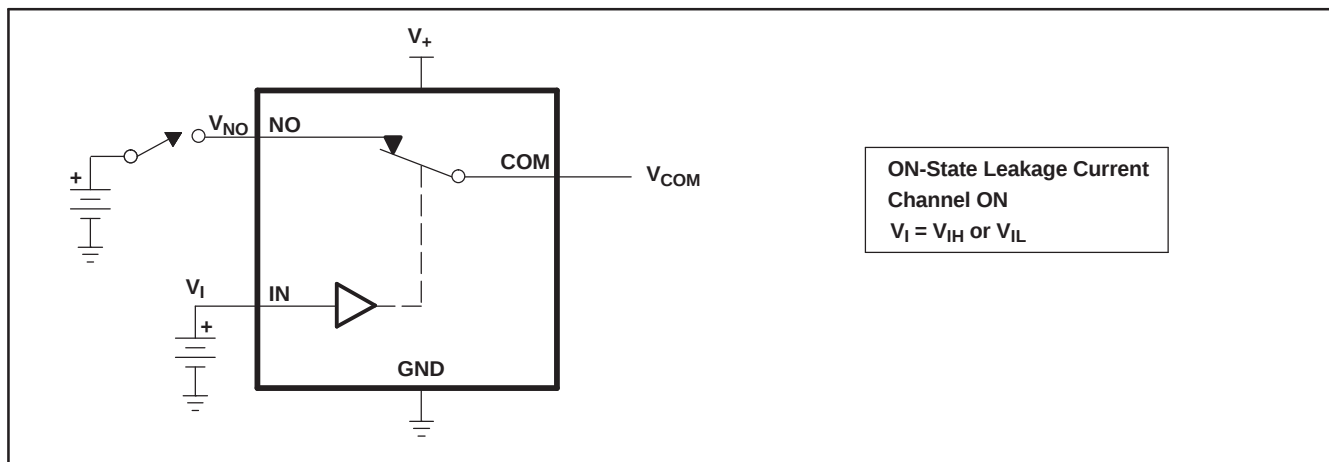


Figure 16. ON-State Leakage Current ($I_{COM(ON)}$, $I_{NC(ON)}$)

PARAMETER MEASUREMENT INFORMATION (continued)

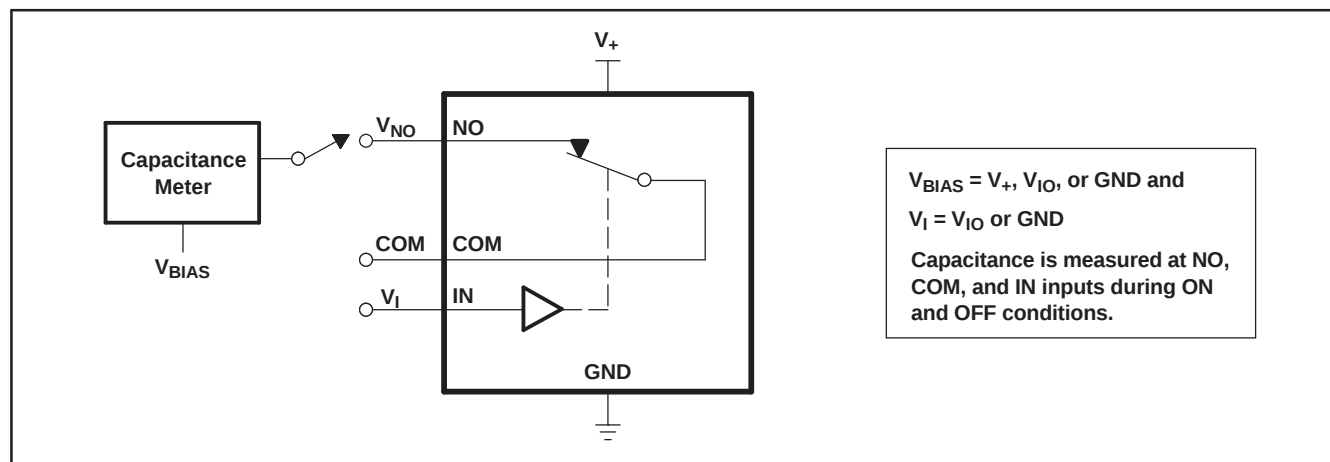
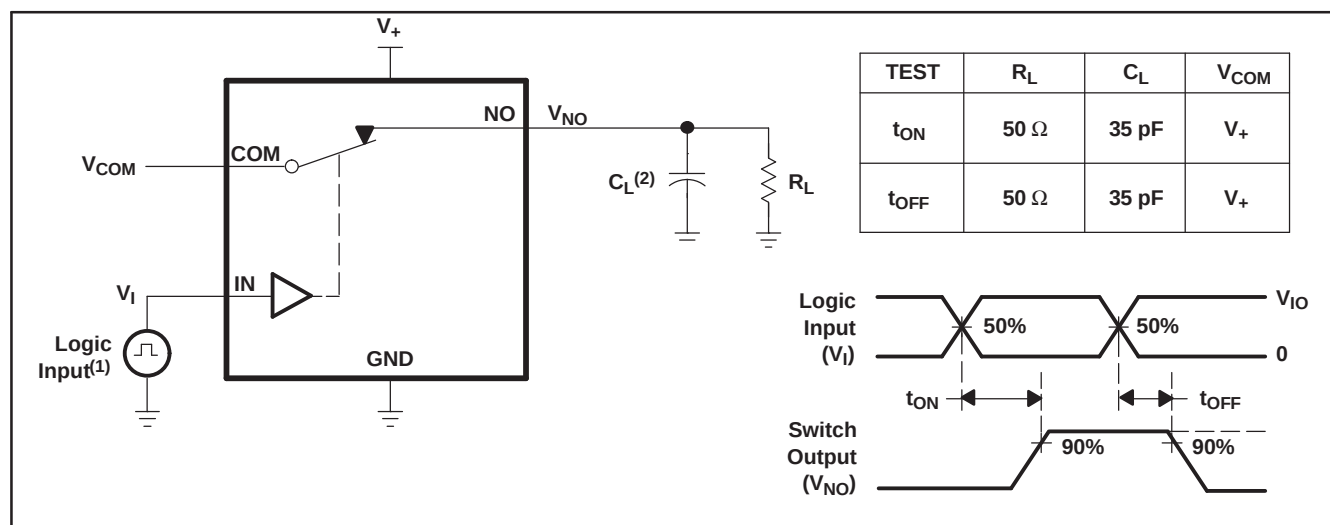


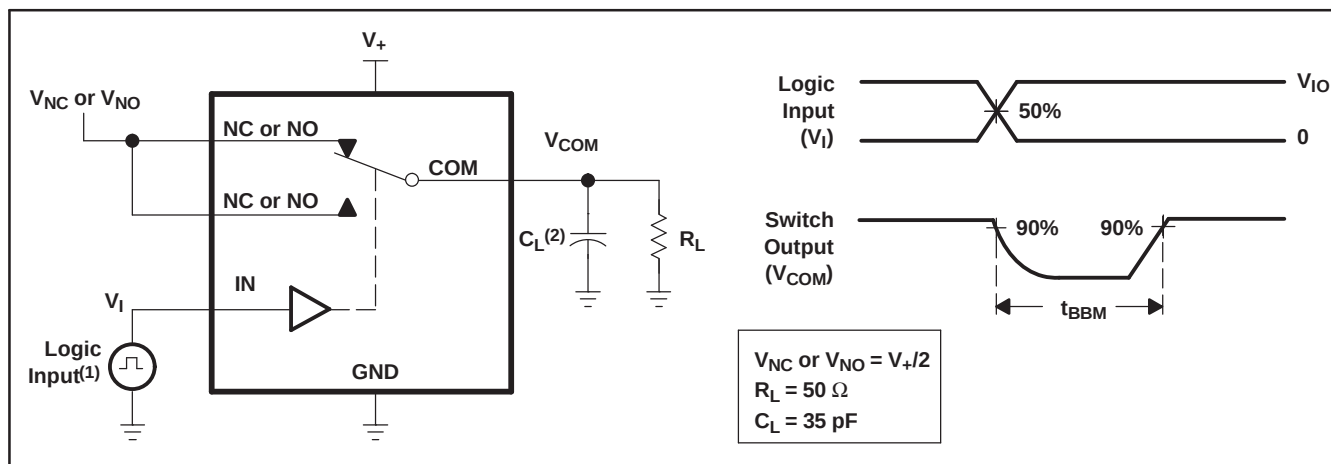
Figure 17. Capacitance (C_I , $C_{COM(OFF)}$, $C_{COM(ON)}$, $C_{NC(OFF)}$, $C_{NC(ON)}$)



NOTES: A. All input pulses are supplied by generators having the following characteristics: $PRR \leq 10\ \text{MHz}$, $Z_O = 50\ \Omega$, $t_r < 5\ \text{ns}$, $t_f < 5\ \text{ns}$.
 B. C_L includes probe and jig capacitance.

Figure 18. Turn-On (t_{ON}) and Turn-Off Time (t_{OFF})

PARAMETER MEASUREMENT INFORMATION (continued)



NOTES: A. All input pulses are supplied by generators having the following characteristics: $PRR \leq 10\ \text{MHz}$, $Z_O = 50\ \Omega$, $t_r < 5\ \text{ns}$, $t_f < 5\ \text{ns}$.
B. C_L includes probe and jig capacitance.

Figure 19. Break-Before-Make Time (t_{BBM})

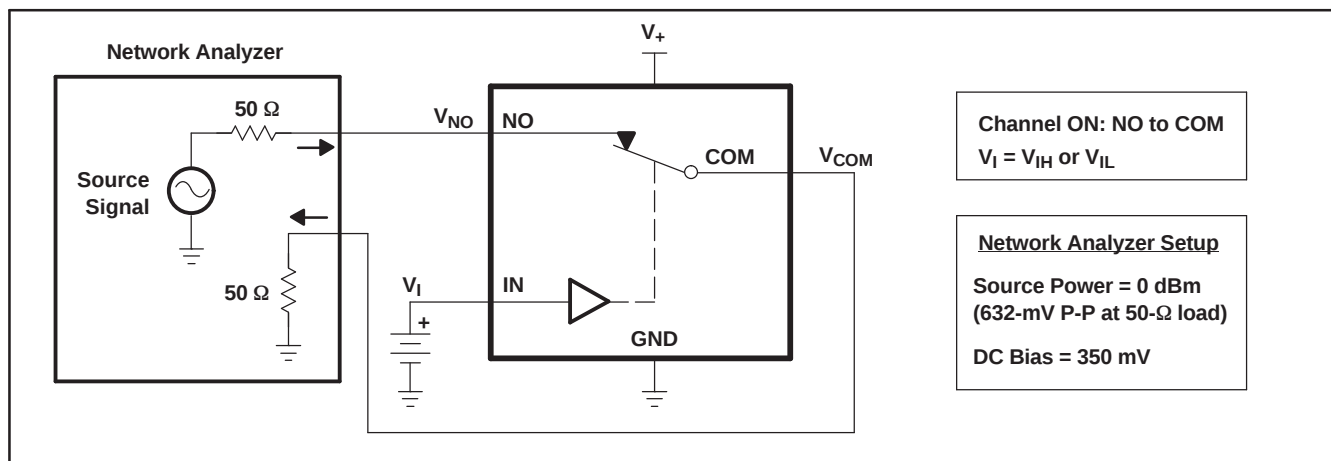


Figure 20. Bandwidth (BW)

PARAMETER MEASUREMENT INFORMATION (continued)

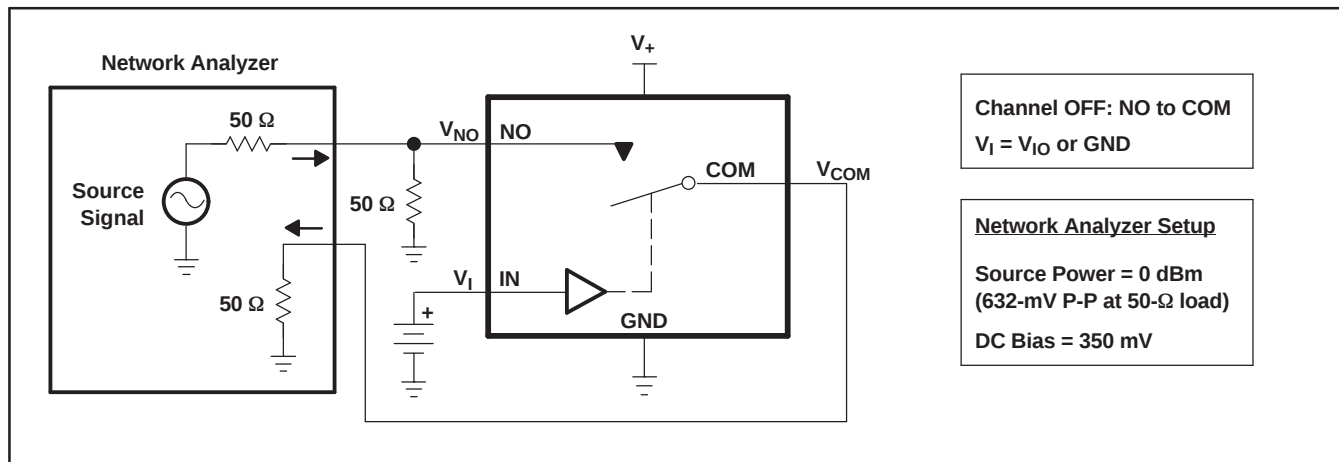


Figure 21. OFF Isolation (O_{ISO})

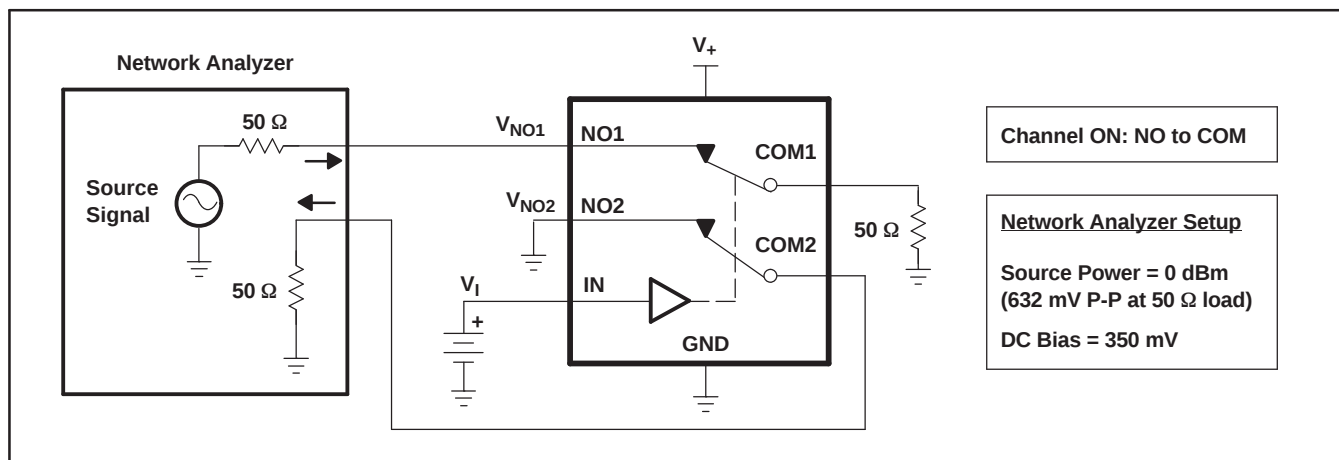
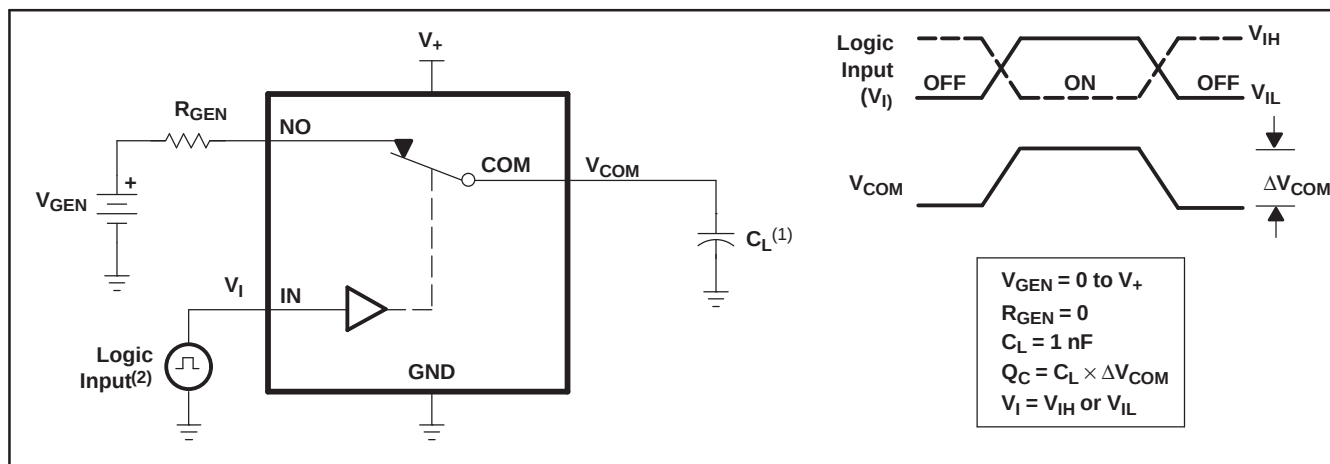


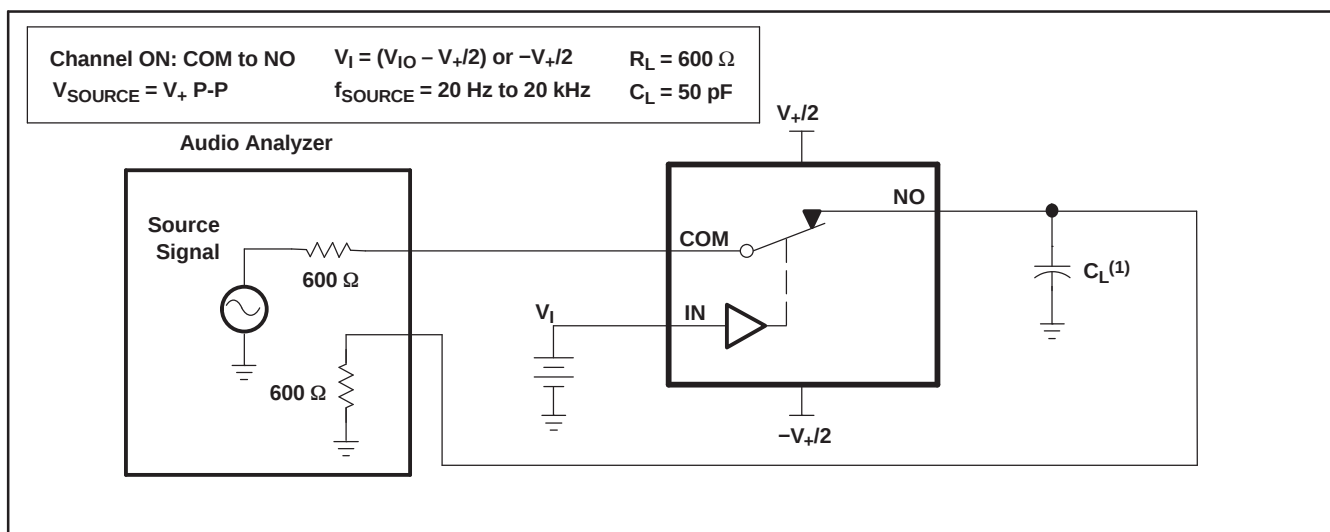
Figure 22. Crosstalk (X_{TALK})

PARAMETER MEASUREMENT INFORMATION (continued)



NOTES: A. C_L includes probe and jig capacitance.
 B. All input pulses are supplied by generators having the following characteristics: $PRR \leq 10 \text{ MHz}$, $Z_O = 50 \Omega$, $t_r < 5 \text{ ns}$, $t_f < 5 \text{ ns}$.

Figure 23. Charge Injection (Q_C)



NOTES: A. C_L includes probe and jig capacitance.

Figure 24. Total Harmonic Distortion (THD)

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
TS5A26542YZTR	Active	Production	DSBGA (YZT) 12	3000 LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	(JN2, JN7, JNN)
TS5A26542YZTR.B	Active	Production	DSBGA (YZT) 12	3000 LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	(JN2, JN7, JNN)

⁽¹⁾ **Status:** For more details on status, see our [product life cycle](#).

⁽²⁾ **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

⁽⁴⁾ **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "-" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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TAPE AND REEL INFORMATION



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
TS5A26542YZTR	DSBGA	YZT	12	3000	178.0	9.2	1.49	1.99	0.75	4.0	8.0	Q2

TAPE AND REEL BOX DIMENSIONS

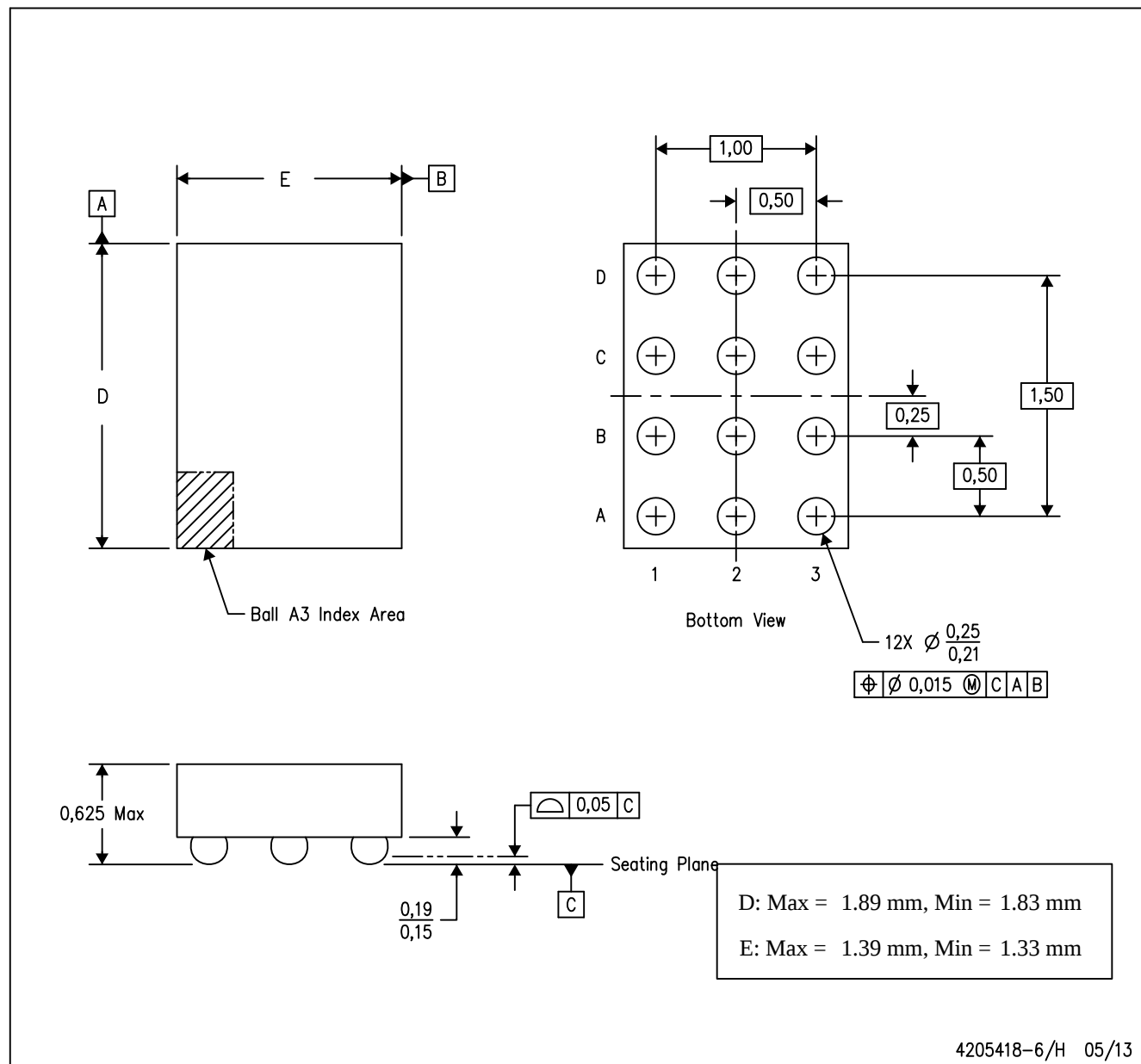


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TS5A26542YZTR	DSBGA	YZT	12	3000	220.0	220.0	35.0

YZT (R-XBGA-N12)

(CUSTOM) DIE-SIZE BALL GRID ARRAY



- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - B. This drawing is subject to change without notice.
 - C. NanoFree™ package configuration.

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