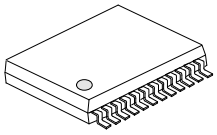
6-BIT, 1-of-2 MULTIPLEXER/DEMULTIPLEXER WITH INTEGRATED IEC L-4 ESD AND 1.8V LOGIC COMPATIBLE CONTROL INPUTS



TSSOP-24

■ DESCRIPTION

The UTC **UMDM27518** is a 6-bit 1-of-2 high-speed multiplexer/ demultiplexer operating from 1.65V to 3.6V. Both digital and analog signals can be handled, and signals up to V_+ can be transmitted in either direction.

The UTC **UMDM27518** has two control pins working separately, each controlling three 1-of-2 multiplexers at the same time. One enable pin is used to put all outputs in high-impedance mode. The control pins are compatible with 1.8V logic thresholds and are backward compatible with 2.5V and 3.3V logic thresholds as well.

The UTC **UMDM27518** allows any SD, SDIO, and multimedia card host controllers to be expanded out to multiple cards or peripherals since the SDIO interface consists of 6-bits: CMD, CLK, and Data [0:3] signals. The UTC **UMDM27518** has two control pins that give additional flexibility to the user. For example, the ability to mux two different audio-video signals in equipment such as an LCD television, an LCD monitor, or a notebook docking station.

■ FEATURES

* 1.65V~3.6V Single-Supply Operation
* Bandwidth up to 240MHz for High-Speed Rail-to-Rail Signal Handling
* Low Capacitance Switches, 21.5pF (Typical)
* Isolation in Powerdown Mode, V_+=0
* 1.8V Logic Threshold Compatibility for Control Inputs
* 3.6V Tolerant Control Inputs
* Crosstalk and Off Isolation of -62dB

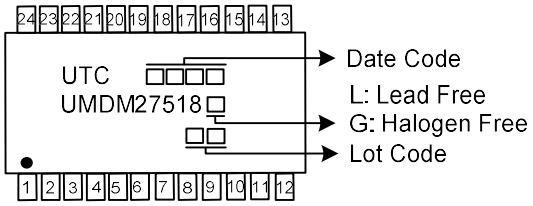
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UMDM27518L-P24-R	UMDM27518G-P24-R	TSSOP-24	Tape Reel

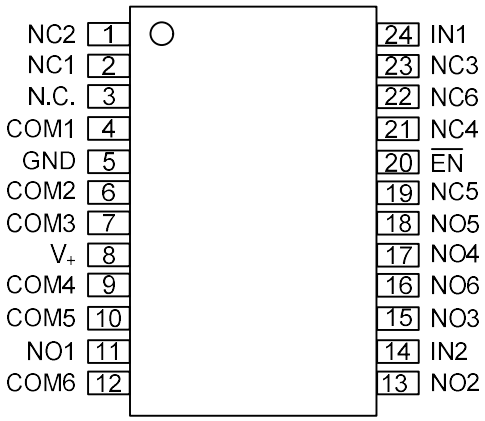
UMDM27518G-P24-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) P24: TSSOP-24
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



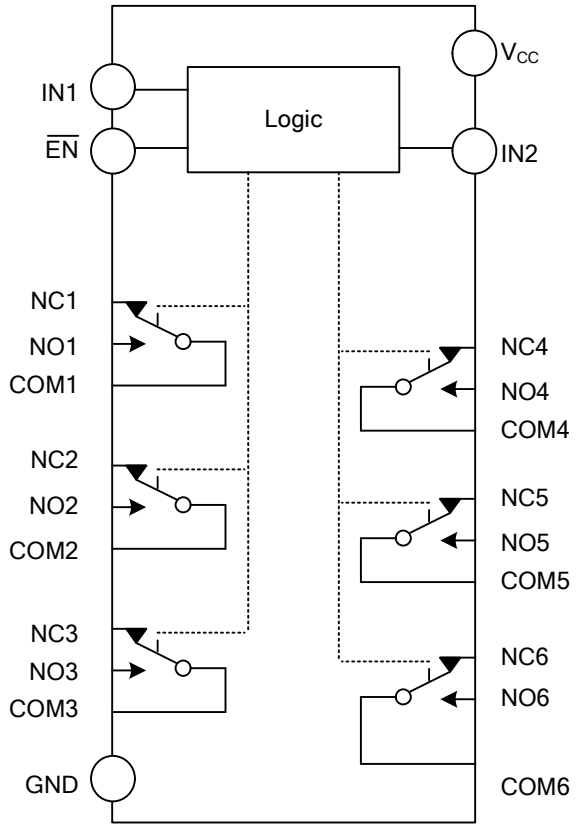
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	NC2	NC Port for BIT 2.
2	NC1	NC Port for BIT 1.
3	N.C.	No Connection.
4	COM1	Common Port for BIT 1.
5	GND	Ground.
6	COM2	Common Port for BIT 2.
7	COM3	Common Port for BIT 3.
8	V_+	Power Supply.
9	COM4	Common Port for BIT 4.
10	COM5	Common Port for BIT 5.
11	NO1	NO Port for BIT 1.
12	COM6	Common Port for BIT 6.
13	NO2	NO Port for BIT 2.
14	IN2	Control BIT 4, 5, 6
15	NO3	NO Port for BIT 3.
16	NO6	NO Port for BIT 6.
17	NO4	NO Port for BIT 4.
18	NO5	NO Port for BIT 1.
19	NC5	NC Port for BIT 5.
20	$\overline{EN}$	Enable.
21	NC4	NC Port for BIT 4.
22	NC6	NC Port for BIT 6.
23	NC3	NC Port for BIT 3.
24	IN1	Control BIT 1, 2, 3

■ LOGIC DIAGRAM



■ FUNCTION TABLE

$\overline{EN}$	IN1	IN2	NC1/2/3 TO COM1/2/3 COM1/2/3 TO NC1/2/3	NC4/5/6 TO COM4/5/6 COM4/5/6 TO NC4/5/6	NO1/2/3 TO COM1/2/3 COM1/2/3 TO NO1/2/3	NO4/5/6 TO COM4/5/6 COM4/5/6 TO NO4/5/6
H	X	X	OFF	OFF	OFF	OFF
L	L	L	ON	ON	OFF	OFF
L	H	L	OFF	ON	ON	OFF
L	L	H	ON	OFF	OFF	ON
L	H	H	OFF	OFF	ON	ON

Note: H: HIGH voltage level, L: LOW voltage level, X = Don't Care.

■ ABSOLUTE MAXIMUM RATINGS

(Over operating free-air temperature range, unless otherwise noted)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage Range (Note 2)		V_+	-0.5 ~ 4.6	V
Analog Voltage Range (Note 2, 3)		V_{NC}, V_{NO}, V_{COM}	-0.5 ~ 4.6	V
Analog Port Diode Current (Note 4)	$V_+<V_{NC}$, V_{NO}, $V_{COM}<0$	I_K	-50	mA
ON-state Switch Current (Note 5)	V_{NC}, V_{NO}, V_{COM}=0~V_+	I_{NC}, I_{NO}, I_{COM}	-50 ~ 50	mA
Digital Input Voltage Range (Note 2, 3)		V_I	-0.5 ~ 4.6	V
Digital Input Clamp Current (Note 2, 3)	$V_{IO}<V_I<0$	I_{IK}	-50	mA
Continuous Current Through V_+		I_+	100	mA
Continuous Current Through GND		I_{GND}	-100	mA
Storage Temperature Range		T_{STG}	-65 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. All voltages are with respect to ground, unless otherwise specified.
3. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
4. Requires clamp diodes on analog port to V_+.
5. Pulse at 1ms duration < 10% duty cycle.

■ ELECTRICAL CHARACTERISTICS FOR 3.3V SUPPLY (Note 1)

(V_+=3V~3.6V, T_A=-40°C~85°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A	V_+	MIN	TYP	MAX	UNIT
ANALOG SWITCH								
Analog Signal Range	V_{COM},V_{NO}, V_{NC}				0		V_+	Ω
ON-state Resistance	R_{ON}	0≤(V_{NC} or V_{NO})≤V_+, I_{COM}=-32mA, Switch ON, See **Figure 1**	25°C	3V		4.4	6.2	Ω
			Full				7.6	Ω
ON-state Resistance Match Between Channels	ΔR_{ON}	V_{NC} or V_{NO}=2.1V, I_{COM}=-32mA, Switch ON, See **Figure 1**	25°C	3V		0.3	0.7	Ω
			Full				0.8	Ω
ON-state Resistance Flatness	$R_{ON (FLAT)}$	0≤(V_{NC} or V_{NO})≤V_+, I_{COM}=-32mA, Switch ON, See **Figure 1**	25°C	3V		0.95	2.1	Ω
			Full				2.3	Ω
NC, NO OFF Leakage Current	$I_{NC (OFF)}$, $I_{NO (OFF)}$	V_{NC} or V_{NO}=1V, V_{COM}=3V, or V_{NC} or V_{NO}=3V, V_{COM}=1V, Switch OFF, See **Figure 2**	25°C	3.6V	-0.5	0.05	0.5	μA
			Full		-7		7	μA
	$I_{NC (PWROFF)}$, $I_{NO (PWROFF)}$	V_{NC} or V_{NO}=0~3.6V, V_{COM}=3.6V~0,or V_{NC} or V_{NO}=3.6V~0, V_{COM}=0~3.6V, Switch OFF, See **Figure 2**	25°C	0V	-1	0.05	1	μA
			Full		-12		12	μA

■ ELECTRICAL CHARACTERISTICS FOR 3.3V SUPPLY (Cont.)

(V_+=3V~3.6V, T=-40°C~85°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A	V_+	MIN	TYP	MAX	UNIT
COM OFF Leakage Current	$I_{COM\ (OFF)}$	V_{NC} or V_{NO}=3V, V_{COM}=1V,or V_{NC} or V_{NO}=1V, V_{COM}=3V, Switch OFF, See **Figure 2**	25°C	3.6V	-1	0.01	1	μA
			Full		-2		2	μA
	$I_{COM\ (PWROFF)}$	V_{NC} or V_{NO}=3.6V~0, V_{COM}=0~3.6V, or V_{NC} or V_{NO}=0~3.6V, V_{COM}=3.6V~0, Switch OFF, See **Figure 2**	25°C	0V	-1	0.02	1	μA
			Full		-12		1	
NC, NO ON Leakage Current	$I_{NO\ (ON)}$, $I_{NC\ (ON)}$	V_{NC} or V_{NO}=1V, V_{COM}=Open, or V_{NC} or V_{NO}=3V, V_{COM}=Open, Switch ON, See **Figure 3**	25°C	3.6V	-2.5	0.04	2.2	μA
			Full		-7		7	μA
COM ON Leakage Current	$I_{COM\ (ON)}$	V_{NC} or V_{NO}=Open, V_{COM}=1V,or V_{NC} or V_{NO}=Open, V_{COM}=3V, Switch ON, See **Figure 3**	25°C	3.6V	-2	0.03	2	μA
			Full		-7		7	μA
DIGITAL CONTROL INPUTS (IN1, IN2, $\overline{EN}$) (NOTE 2)								
Input Logic High	V_{IH}		Full	3.6V	1.2		3.6	V
Input Logic Low	V_{IL}		Full	3.6V	0		0.65	V
Input leakage Current	I_{IH}, I_{IL}	V_I=V_+ or 0	25°C	3.6V	-0.1	0.05	0.1	μA
			Full		-2.5		2.5	μA
DYNAMIC								
Turn-on Time	T_{ON}	V_{COM}=V_+, R_L=50Ω, C_L=35pF, See **Figure 5**	25°C	3.3V		18.1	59	ns
			Full	3V~3.6V			60	ns
Turn-off Time	T_{OFF}	V_{COM}=V_+, R_L=50Ω, C_L=35pF, See **Figure 5**	25°C	3.3V		25.4	60.6	ns
			Full	3V~3.6V			61	ns
Break-before-make Time	T_{BBM}	V_{NC}=V_{NO}=V_+/2, R_L=50Ω, C_L=35pF, See **Figure 6**	25°C	3.3V	4	11.1	22.7	ns
			Full	3V~3.6V			28	ns
Charge Injection	Q_C	V_{GEN}=0, R_{GEN}=0, C_L=0.1nF, See **Figure 10**	25°C	3.3V		0.81		pC
NC, NO OFF Capacitance	$C_{NC\ (OFF)}$, $C_{NO\ (OFF)}$	V_{NC} or V_{NO}=V_+ or GND, Switch OFF, See **Figure 4**	25°C	3.3V		13		pF
COM OFF capacitance	$C_{COM\ (OFF)}$	V_{NC} or V_{NO}=V_+ or GND, Switch OFF, See **Figure 4**		3.3V		8.5		pF
NC, NO ON Capacitance	$C_{NC\ (ON)}$, $C_{NO\ (ON)}$	V_{NC} or V_{NO}=V_+ or GND, Switch ON, See **Figure 4**	25°C	3.3V		21.5		pF
COM ON Capacitance	$C_{COM\ (ON)}$	V_{COM}=V_+ or GND, Switch ON, See **Figure 4**	25°C	3.3V		21.5		pF
Digital Input Capacitance	C_I	V_I=V_+ or GND, See **Figure 4**	25°C	3.3V		2		pF

■ ELECTRICAL CHARACTERISTICS FOR 3.3V SUPPLY (Cont.)

(V_+=3V~3.6V, T=-40°C~85°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A	V_+	MIN	TYP	MAX	UNIT
Bandwidth	BW	R_L=50Ω, See **Figure 7**	25°C	3.3V		240		MHz
OFF Isolation	O_{ISO}	R_L=50Ω, f=10MHz, See **Figure 8**	25°C	3.3V		-62		dB
Crosstalk	X_{TALK}	R_L=50Ω, f=1MHz, See **Figure 9**	25°C	3.3V		-62		dB
Crosstalk Adjacent	$X_{TALK\ (ADJ)}$	R_L=50Ω, f=10MHz, See **Figure 9**	25°C	3.3V		-71		dB
Total Harmonic Distortion	T_{HD}	R_L=600Ω, C_L=50pF, f=20Hz~20 kHz, See **Figure 11**	25°C	3.3V		0.05		%
SUPPLY								
Positive Supply Current	I_+	V_I=V_+ or GND, Switch ON or OFF	25°C	3.6V		0.04	0.3	μA
			Full				3	μA

Notes: 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_+ or GND to ensure proper device operation.

■ ELECTRICAL CHARACTERISTICS FOR 2.5V SUPPLY (Note 1)

(V_+=2.3V~2.7V, T=-40°C~85°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A	V_+	MIN	TYP	MAX	UNIT
ANALOG SWITCH								
Analog Signal Range	V_{COM}, V_{NO}, V_{NC}				0		V_+	Ω
ON-state Resistance	R_{ON}	0≤(V_{NC} or V_{NO})≤V_+, I_{COM}=-32mA, Switch ON, See **Figure 1**	25°C	2.3V		5.5	9.6	Ω
			Full				11.5	Ω
ON-state Resistance Match Between Channels	ΔR_{ON}	V_{NC} or V_{NO}=1.6V, I_{COM}=-32mA, Switch ON, See **Figure 1**	25°C	2.3V		0.3	0.8	Ω
			Full				0.9	Ω
ON-state Resistance Flatness	$R_{ON (FLAT)}$	0≤(V_{NC} or V_{NO})≤V_+, I_{COM}=-32mA, Switch ON, See **Figure 1**	25°C	2.3V		0.91	2.2	Ω
			Full				2.3	Ω
NC, NO OFF Leakage Current	$I_{NC (OFF)}$, $I_{NO (OFF)}$	V_{NC} or V_{NO}=0.5V, V_{COM}=2.3V, or V_{NC} or V_{NO}=2.3V, V_{COM}=0.5V, Switch OFF, See **Figure 2**	25°C	2.7V	-0.3	0.04	0.3	μA
			Full		-6		6	μA
	$I_{NC (PWROFF)}$, $I_{NO (PWROFF)}$	V_{NC} or V_{NO}=0~2.7V, V_{COM}=2.7V~0, or V_{NC} or V_{NO}=2.7V~ 0, V_{COM}=0~2.7V, Switch OFF, See **Figure 2**	25°C	0V	-0.6	0.02	0.6	μA
			Full		-10		10	μA
COM OFF Leakage Current	$I_{COM (OFF)}$	V_{NC} or V_{NO}=0.5V, V_{COM}=2.3V, or V_{NC} or V_{NO}=2.3V, V_{COM}=0.5V, Switch OFF, See **Figure 2**	25°C	2.7V	-0.7	0.02	0.7	μA
			Full		-1		1	μA
	$I_{COM (PWROFF)}$	V_{NC} or V_{NO}=2.7V~0, V_{COM}=0~2.7V, or V_{NC} or V_{NO}=0~2.7V, V_{COM}=2.7V~0, Switch OFF, See **Figure 2**	25°C	0V	-0.7	0.02	0.7	μA
			Full		-7.2		7.2	
NC, NO ON Leakage Current	$I_{NO (ON)}$, $I_{NC (ON)}$	V_{NC} or V_{NO}=0.5V or 2.3V, V_{COM}=Open, Switch ON, See **Figure 3**	25°C	2.7V	-2.1	0.03	2.1	μA
			Full		-6		6	μA
COM ON Leakage Current	$I_{COM (ON)}$	V_{NC} or V_{NO}=Open, V_{COM}=0.5V, or V_{NC} or V_{NO}=Open, V_{COM}=2.3V, Switch ON, See **Figure 3**	25°C	2.7V	-2	0.02	2	μA
			Full		-5.7		5.7	μA
DIGITAL CONTROL INPUTS (IN1, IN2, $\overline{EN}$) (NOTE 2)								
Input Logic High	V_{IH}	V_I=V_+ or GND	Full	2.7V	1.15		3.6	V
Input Logic Low	V_{IL}		Full	2.7V	0		0.55	V
Input Leakage Current	I_{IH}, I_{IL}	V_I=V_+ or 0	25°C	2.7V	-0.1	0.01	0.1	μA
			Full		-2.1		2.1	μA

■ ELECTRICAL CHARACTERISTICS FOR 2.5V SUPPLY (Cont.)

(V_+=2.3V~2.7V, T=-40°C~85°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A	V_+	MIN	TYP	MAX	UNIT
DYNAMIC								
Turn-on time	T_{ON}	V_{COM}=V_+, C_L=35pF, R_L=50Ω, See **Figure 5**	25°C	2.5V		17.2	36.8	ns
			Full	2.3V ~ 2.7V			42.5	ns
Turn-off time	T_{OFF}	V_{COM}=V_+, C_L=35pF, R_L=50Ω, See **Figure 5**	25°C	2.5V			29.8	ns
			Full	2.3V ~ 2.7V			34.4	ns
Break-before-make Time	T_{BBM}	V_{NC}=V_{NO}=V_+/2, C_L=35pF, R_L=50Ω, See **Figure 6**	25°C	2.5V	4.5	13	30	ns
			Full	2.3V ~ 2.7V			33.3	ns
Charge Injection	Q_C	V_{GEN}=0, C_L=0.1nF, R_{GEN}=0, See **Figure 10**	25°C	2.5V		0.47		pC
NC, NO OFF Capacitance	$C_{NC\ (OFF)}$, $C_{NO\ (OFF)}$	V_{NC} or V_{NO}=V_+ or GND, Switch OFF, See **Figure 4**	25°C	2.5V		13.5		pF
COM OFF Capacitance	$C_{COM\ (OFF)}$	V_{NC} or V_{NO}=V_+ or GND, Switch OFF, See **Figure 4**	25°C	2.5V		9		pF
NC, NO ON Capacitance	$C_{NC\ (ON)}$, $C_{NO\ (ON)}$	V_{NC} or V_{NO}=V_+ or GND, Switch ON, See **Figure 4**	25°C	2.5V		22		pF
COM ON Capacitance	$C_{COM\ (ON)}$	V_{COM}=V_+ or GND, Switch ON, See **Figure 4**	25°C	2.5V		22		pF
Digital Input Capacitance	C_I	V_I=V_+ or GND, See **Figure 4**	25°C	2.5V		2		pF
Bandwidth	BW	R_L=50Ω, Switch ON, See **Figure 7**	25°C	2.5V		240		MHz
OFF Isolation	O_{ISO}	R_L=50Ω, f=10MHz, Switch OFF, See **Figure 8**	25°C	2.5V		-62		dB
Crosstalk	X_{TALK}	R_L=50Ω, f=10MHz, Switch ON, See **Figure 9**	25°C	2.5V		-62		dB
Crosstalk Adjacent	$X_{TALK\ (ADJ)}$	R_L=50Ω, f=10MHz, Switch ON, See **Figure 9**	25°C	2.5V		-71		dB
Total Harmonic Distortion	THD	R_L=600Ω, f=20Hz~20kHz, C_L=50pF, See **Figure 11**	25°C	2.5V		0.06		%
SUPPLY								
Positive Supply Current	I_+	V_I=V_+ or GND, Switch ON or OFF	25°C	2.7V		0.01	0.1	μA
			Full				2	μA

Notes: 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_+ or GND to ensure proper device operation.

■ ELECTRICAL CHARACTERISTICS FOR 1.8V SUPPLY (Note 1)

(V_+=1.65V~1.95V, T_A=-40°C~85°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A	V_+	MIN	TYP	MAX	UNIT
ANALOG SWITCH								
Analog Signal Range	V_{COM}, V_{NO}, V_{NC}				0		V_+	Ω
ON-state Resistance	R_{ON}	0≤(V_{NC} or V_{NO})≤V_+, I_{COM}=-32mA, Switch ON, See **Figure 1**	25°C	1.65V		7.1	14.4	Ω
			Full				16.3	Ω
ON-state Resistance Match Between Channels	ΔR_{ON}	V_{NC} or V_{NO}=1.6V, I_{COM}=-32mA, Switch ON, See **Figure 1**	25°C	1.65V		0.3	1	Ω
			Full				1.2	Ω
ON-state Resistance Flatness	$R_{ON (FLAT)}$	0≤(V_{NC} or V_{NO})≤V_+, I_{COM}=-32mA, Switch ON, See **Figure 1**	25°C	1.65V		2.7	5.5	Ω
			Full				7.3	Ω
NC, NO OFF Leakage Current	$I_{NC (OFF)}$, $I_{NO (OFF)}$	V_{NC} or V_{NO}=0.3V, V_{COM}=1.65V, or V_{NC} or V_{NO}=1.65V, V_{COM}=0.3V, Switch OFF, See **Figure 2**	25°C	1.95V	-0.25	0.03	0.25	μA
			Full		-5		5	μA
	$I_{NC (PWROFF)}$, $I_{NO (PWROFF)}$	V_{NC} or V_{NO}=1.95V~0, V_{COM}=0~1.95, or V_{NC} or V_{NO}=0~ 1.95V, V_{COM}=1.95V~0, Switch OFF, See **Figure 2**	25°C	0V	-0.4	0.02	0.4	μA
			Full		-7.2		7.2	μA
COM OFF Leakage Current	$I_{COM (OFF)}$, $I_{COM (OFF)}$	V_{NC} or V_{NO}=0.3V, V_{COM}=1.65V, or V_{NC} or V_{NO}=1.65V, V_{COM}=0.3V, Switch OFF, See **Figure 2**	25°C	1.95V	-0.4	0.02	0.4	μA
			Full		-0.9		0.9	μA
	$I_{COM (PWROFF)}$, $I_{COM (PWROFF)}$	V_{NC} or V_{NO}=1.95V~0, V_{COM} = 0~1.95V, or V_{NC} or V_{NO}=0~1.95V, V_{COM}=1.95V~0, Switch OFF, See **Figure 2**	25°C	0V	-0.4	0.02	0.4	μA
			Full		-5		5	μA
NC, NO ON Leakage Current	$I_{NO (ON)}$, $I_{NC (ON)}$	V_{NC} or V_{NO}=0.3V, V_{COM}=Open, or V_{NC} or V_{NO}=1.65V, V_{COM}=Open, Switch ON, See **Figure 3**	25°C	1.95V	-2	0.02	2	μA
			Full		-5.2		5.2	μA
COM ON Leakage Current	$I_{COM (ON)}$	V_{NC} or V_{NO}=Open, V_{COM}=0.3V,or V_{NC} or V_{NO}=Open, V_{COM}=1.65V, Switch ON, See **Figure 3**	25°C	1.95V	-2	0.02	2	μA
			Full		-5.2		5.2	μA
DIGITAL CONTROL INPUTS (IN1, IN2, $\overline{EN}$) (NOTE 2)								
Input Logic High	V_{IH}	V_I=V_+ or GND	Full	1.95V	1		3.6	V
Input Logic Low	V_{IL}		Full	1.95V	0		0.4	V
Input Leakage Current	I_{IH}, I_{IL}	V_I=V_+ or 0	25°C	1.95V	-0.1	0.01	0.1	μA
			Full		-2.1		2.1	μA

■ ELECTRICAL CHARACTERISTICS FOR 1.8V SUPPLY (Cont.)

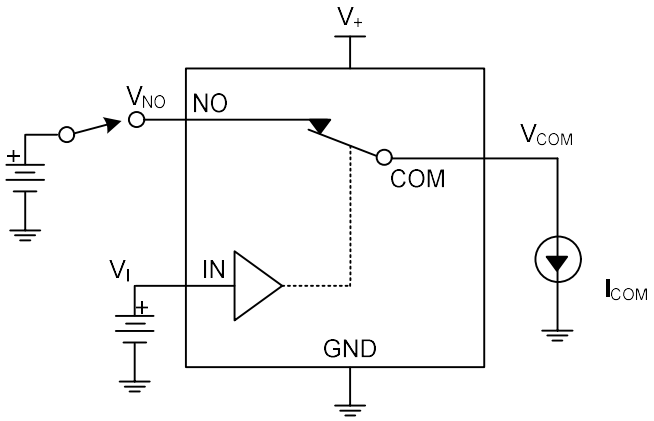
(V_+=1.65V~1.95V, T_A=-40°C~85°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A	V_+	MIN	TYP	MAX	UNIT
DYNAMIC								
Turn-on time	T_{ON}	V_{COM}=V_+, C_L=35pF, R_L=50Ω, See **Figure 5**	25°C	1.8V		14.1	49.3	ns
			Full	1.65V ~ 1.95V			56.7	ns
Turn-off time	T_{OFF}	V_{COM}=V_+, C_L=35pF, R_L=50Ω, See **Figure 5**	25°C	1.8V		16.1	26.5	ns
			Full	1.65V ~ 1.95V			31.2	ns
Break-before-make Time	T_{BBM}	V_{NC}=V_{NO}=V_+/2, C_L=35pF, R_L=50Ω, See **Figure 6**	25°C	1.8V	5.3	18.4	58	ns
			Full	1.65V ~ 1.95V			58	ns
Charge Injection	Q_C	V_{GEN}=0, C_L=1nF, R_{GEN}=0, See **Figure 10**	25°C	1.8V		0.21		pC
NC, NO OFF Capacitance	$C_{NC\ (OFF)}$, $C_{NO\ (OFF)}$	V_{NC} or V_{NO}=V_+ or GND, Switch OFF, See **Figure 4**	25°C	1.8V		9		pF
NC, NO ON Capacitance	$C_{NC\ (ON)}$, $C_{NO\ (ON)}$	V_{NC} or V_{NO}=V_+ or GND, Switch ON, See **Figure 4**	25°C	1.8V		22		pF
COM ON Capacitance	$C_{COM\ (ON)}$	V_{COM}=V_+ or GND, Switch ON, See **Figure 4**	25°C	1.8V		22		pF
Digital Input Capacitance	C_I	V_I=V_+ or GND, See **Figure 4**	25°C	1.8V		2		pF
Bandwidth	BW	R_L=50Ω, Switch ON, See **Figure 7**	25°C	1.8V		240		MHz
OFF Isolation	O_{ISO}	R_L=50Ω, f=10MHz, Switch OFF, See **Figure 8**	25°C	1.8V		-60		dB
Crosstalk	X_{TALK}	R_L=50Ω, f=10MHz, Switch ON, See **Figure 9**	25°C	1.8V		-60		dB
Crosstalk Adjacent	$X_{TALK\ (ADJ)}$	R_L=50Ω, f=10MHz, Switch ON, See **Figure 9**	25°C	1.8V		-71		dB
Total Harmonic Distortion	THD	R_L=600Ω, f=20Hz~20kHz, C_L=50pF, See **Figure 11**	25°C	1.8V		0.1		%
SUPPLY								
Positive Supply Current	I_+	V_I=V_+ or GND, Switch ON or OFF	25°C	1.95V		0.01	0.1	μA
			Full				1.5	μA

Notes: 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_+ or GND to ensure proper device operation.

■ PARAMETER MEASUREMENT INFORMATION

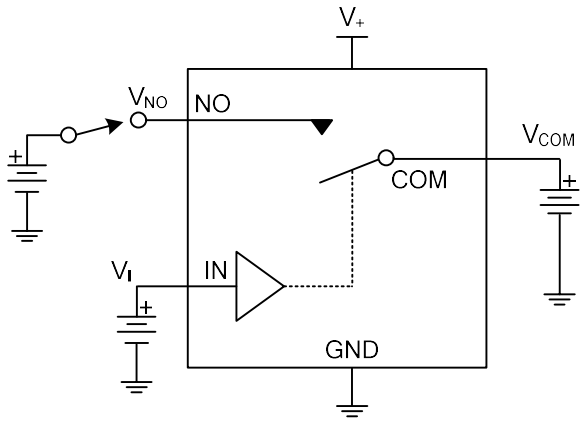


Channel ON

$R_{ON}=\frac{V_{COM}-V_{NO}}{I_{COM}}\Omega$

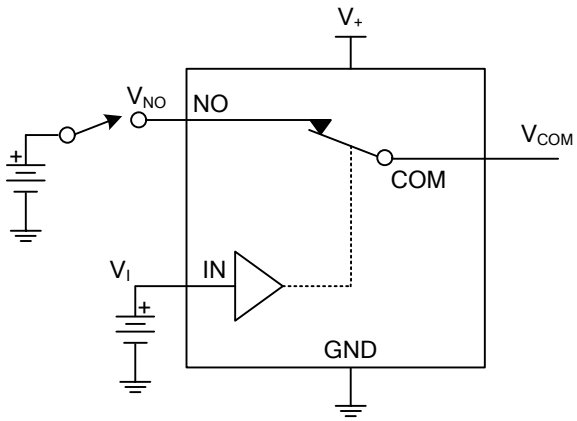
$V_{IN}=V_{IH}$ or V_{IL}

Figure 1. ON-state Resistance (R_{ON})



OFF-State Leakage Current
Channel OFF
$V_{IN}=V_{IH}$ or V_{IL}

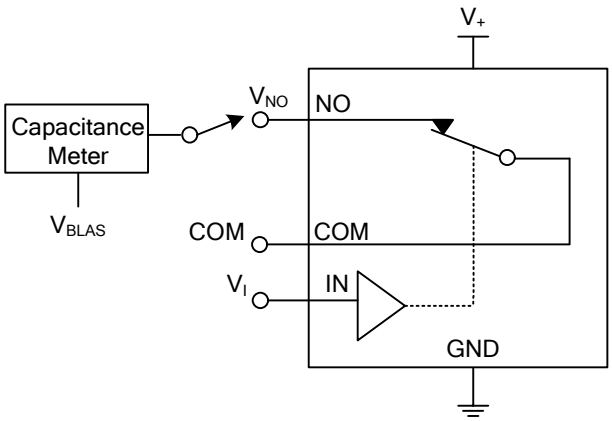
Figure 2. OFF-State Leakage Current
($I_{COM\,(OFF)}$, $I_{NC\,(OFF)}$, $I_{COM\,(PWROFF)}$, $I_{NC\,(PWROFF)}$)



ON-state Leakage Current
Channel ON
$V_{IN}=V_{IH}$ or V_{IL}

Figure 3. ON-state Leakage Current
($I_{COM\,(ON)}$, $I_{NC\,(ON)}$)

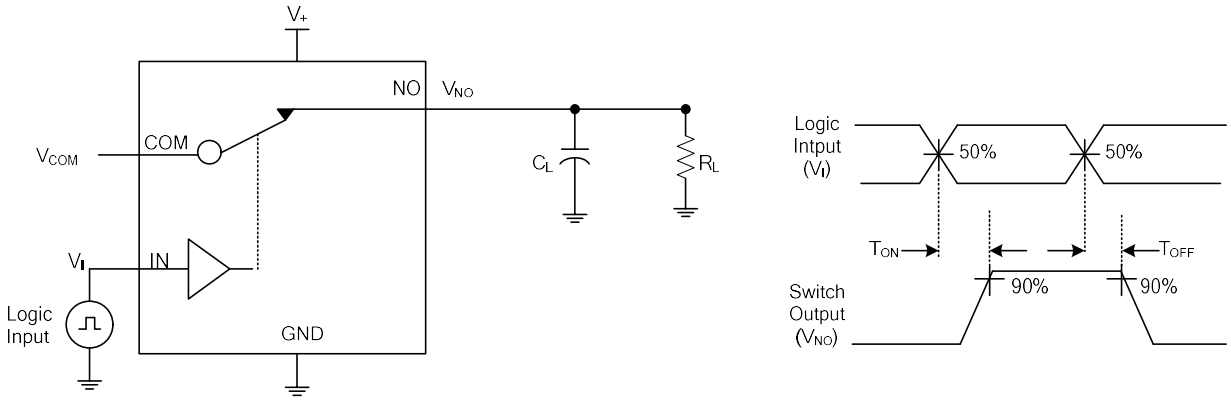
■ PARAMETER MEASUREMENT INFORMATION (Cont.)



V_{BLAS}=V_+ or GND and V_I=V_{IH} or V_{IL}
Capacitance is measured at NO, COM, and IN inputs during ON and OFF conditions

Figure 4. Capacitance
(C_I, $C_{COM\ (OFF)}$, $C_{COM\ (ON)}$, $C_{NC\ (OFF)}$,$C_{NC\ (ON)}$)

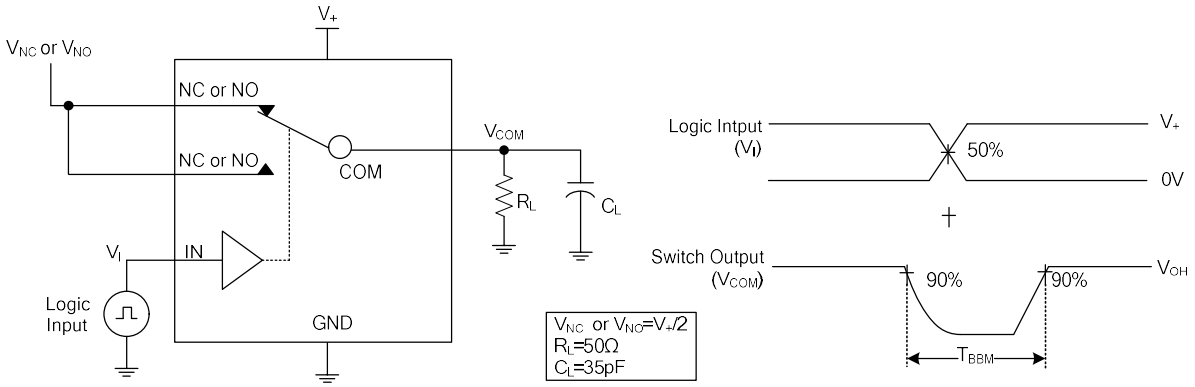
TEST	R_L	C_L	V_{COM}
T_{ON}	50Ω	35pF	V_+
T_{OFF}	50Ω	35pF	V_+



Note 1:All input pulses are supplied by generators having the following characteristics: PRR≤10MHz, Z_O=50Ω, T_R<5ns, T_F<5ns.
Note 2: C_L includes probe and jig capacitance.

Figure 5. Turn-On (T_{ON}) and Turn-Off Time (T_{OFF})

■ PARAMETER MEASUREMENT INFORMATION (Cont.)



Note 1:All input pulses are supplied by generators having the following characteristics: PRR≤10MHz, Z_O=50Ω, T_R<5ns, T_F<5ns.
Note 2: C_L includes probe and jig capacitance.

Figure 6. Break-Before-Make Time (T_{BBM})

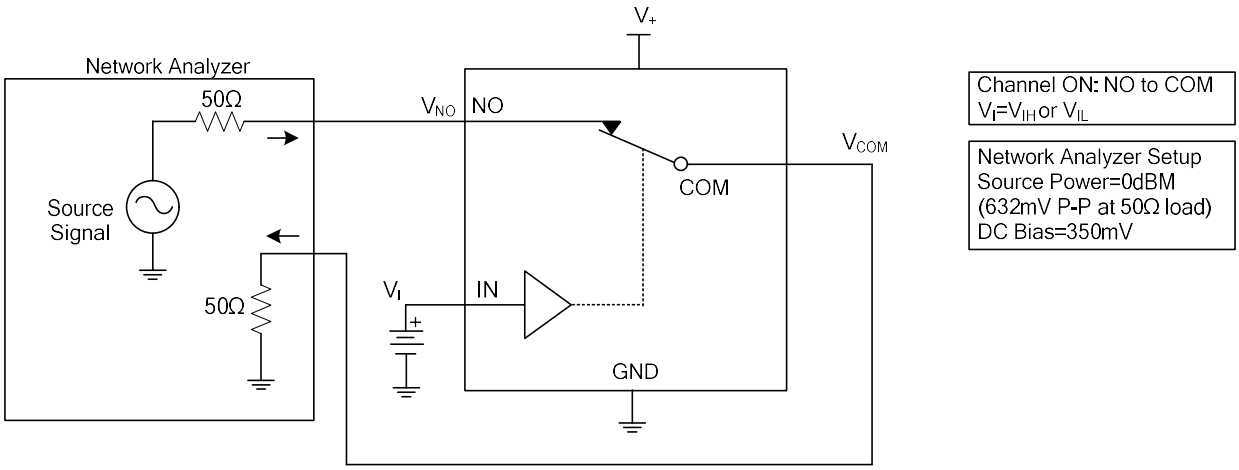
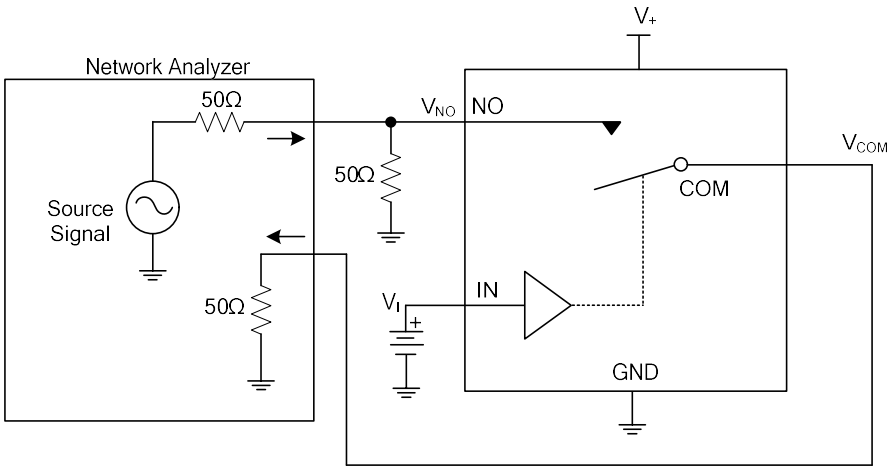


Figure 7. Bandwidth (BW)

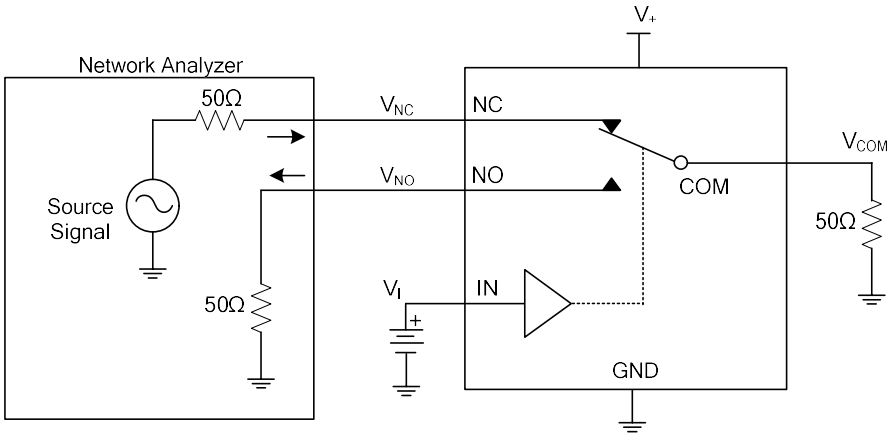
■ PARAMETER MEASUREMENT INFORMATION (Cont.)



Channel OFF: NO to COM
V_I=V_{IH} or V_{IL}

Network Analyzer Setup
Source Power=0dBM
(632mV P-P at 50Ω load)
DC Bias=350mV

Figure 8. OFF Isolation (O_{ISO})

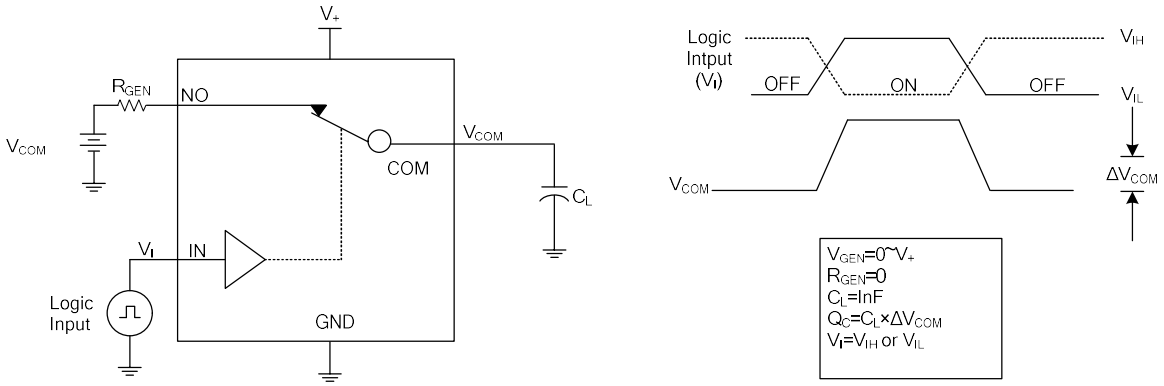


Channel ON: NC to COM
Channel OFF: NO to COM
V_I=V_{IH} or V_{IL}

Network Analyzer Setup
Source Power=0dBM
(632mV P-P at 50Ω load)
DC Bias=350mV

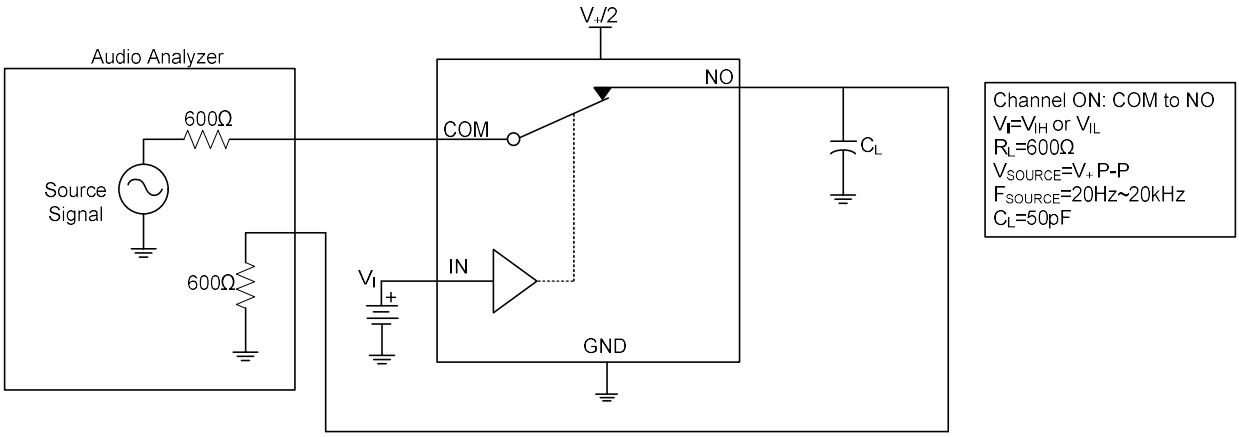
Figure 9. Crosstalk (X_{TALK})

■ PARAMETER MEASUREMENT INFORMATION (Cont.)



Note 1:All input pulses are supplied by generators having the following characteristics: PRR≤10MHz, Z_O=50Ω, T_R<5ns, T_F<5ns.
Note 2: C_L includes probe and jig capacitance.

Figure 10. Charge Injection (Q_C)



Note: CL includes probe and jig capacitance.

Figure 11. Total Harmonic Distortion (THD)

■ TYPICAL APPLICATION CIRCUIT