PACKAGE/ORDERING INFORMATION
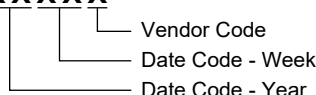
MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM44602	TQFN-2.6×1.8-16L	-40℃ to +85℃	SGM44602YTQA16/TR	44602 XXXXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXXX = Date Code and Vendor Code.

X X X X X
- Vendor Code
- Date Code - Week
- Date Code - Year

Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS

V_+ to GND ....0V to 6V
Analog, Digital Voltage Range ....-0.3V to (V_+) + 0.3V
Continuous Current NO, NC, or COM.......................±100mA
Junction Temperature...+150℃
Storage Temperature Range ....-65℃ to +150℃
Lead Temperature (Soldering, 10s)...........................+260℃

RECOMMENDED OPERATING CONDITIONS

Operating Temperature Range ....-40℃ to +85℃

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

ESD SENSITIVITY CAUTION

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

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PIN CONFIGURATION

(TOP VIEW)

TQFN-2.6×1.8-16L
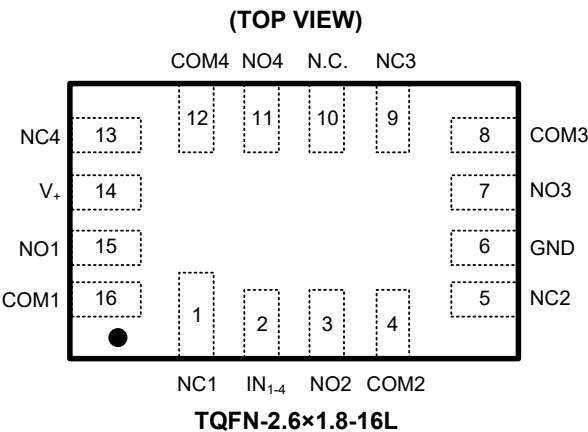
PIN DESCRIPTION

PIN	NAME	FUNCTION
1, 5, 9, 13	NC_X	Normally-Closed Terminal.
2	IN_{1-4}	Digital Control Pin to Connect the COM Terminal to the NO or NC Terminals.
6	GND	Ground.
10	N.C.	Not Internally Connected.
14	V_+	Power Supply.
15, 3, 7, 11	NO_X	Normally-Open Terminal.
16, 4, 8, 12	COM_X	Common Terminal.

FUNCTION TABLE

IN_{1-4}	FUNCTION	
	NC1, 2, 3 and 4	NO1, 2, 3 and 4
0	ON	OFF
1	OFF	ON

ELECTRICAL CHARACTERISTICS

(V$_+$ = 4.5V to 5.5V, GND = 0V, V$_{IH}$ = 1.6V, V$_{IL}$ = 0.5V, Full = -40℃ to +85℃. Typical values are at V$_+$ = 5V, T$_A$ = +25℃, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		TEMP	MIN	TYP	MAX	UNITS
Analog Switch								
Analog Signal Range	V$_{NO}$, V$_{NC}$, V$_{COM}$			Full	0		V$_+$	V
On-Resistance	R$_{ON}$	V$_+$ = 4.5V, 0V ≤ V$_{NO}$ or V$_{NC}$ ≤ V$_+$, I$_{COM}$ = -100mA, Test Circuit 1		+25℃		4	6	Ω
				Full			7	
On-Resistance Match between Channels	ΔR$_{ON}$	V$_+$ = 4.5V, 0V ≤ V$_{NO}$ or V$_{NC}$ ≤ V$_+$, I$_{COM}$ = -100mA, Test Circuit 1		+25℃		0.4	2.5	Ω
				Full			3	
On-Resistance Flatness	R$_{FLAT(ON)}$	V$_+$ = 4.5V, 0V ≤ V$_{NO}$ or V$_{NC}$ ≤ V$_+$, I$_{COM}$ = -100mA, Test Circuit 1		+25℃		2	3	Ω
				Full			3.5	
Source Off Leakage Current	I$_{NC(OFF)}$, I$_{NO(OFF)}$	V$_+$ = 5.5V, V$_{NO}$ or V$_{NC}$ = 3.3V/0.3V, V$_{COM}$ = 0.3V/3.3V		Full			1	µA
Channel On Leakage Current	I$_{NC(ON)}$, I$_{NO(ON)}$, I$_{COM(ON)}$	V$_+$ = 5.5V, V$_{COM}$ = 0.3V/3.3V, V$_{NO}$ or V$_{NC}$ = 0.3V/3.3V or floating		Full			1	µA
Digital Inputs								
Input High Voltage	V$_{INH}$			Full	1.6			V
Input Low Voltage	V$_{INL}$			Full			0.5	V
Input Leakage Current	I$_{IN}$	V$_+$ = 5.5V, V$_{IN}$ = 0V or 5.5V		Full			1	µA
Dynamic Characteristics								
Turn-On Time	t$_{ON}$	V$_{NC}$ or V$_{NO}$ = 3V, R$_L$ = 300Ω, C$_L$ = 35pF, Test Circuit 2		+25℃		32		ns
Turn-Off Time	t$_{OFF}$			+25℃		26		ns
Break-Before-Make Time Delay	t$_D$	V$_{NC}$ or V$_{NO}$ = 3V, R$_L$ = 300Ω, C$_L$ = 35pF, Test Circuit 4		+25℃		15.5		ns
Charge Injection	Q	V$_G$ = GND, R$_G$ = 0Ω, C$_L$ = 1nF, Q = C$_L$ × V$_{OUT}$, Test Circuit 3		+25℃		4.8		pC
Off Isolation	O$_{ISO}$	Signal = 0dBm, R$_L$ = 50Ω, Test Circuit 5	1MHz	+25℃		-75		dB
			10MHz	+25℃		-55		
Channel-to-Channel Crosstalk	X$_{TALK}$	Signal = 0dBm, R$_L$ = 50Ω, Test Circuit 6	1MHz	+25℃		-100		dB
			10MHz	+25℃		-60		
-3dB Bandwidth	BW	Signal = 0dBm, R$_L$ = 50Ω, Test Circuit 7		+25℃		300		MHz
Channel On Capacitance	C$_{NC(ON)}$, C$_{NO(ON)}$, C$_{COM(ON)}$			+25℃		45		pF
Power Requirements								
Power Supply Range	V$_+$			Full	1.8		5.5	V
Power Supply Current	I$_+$	V$_+$ = 5.5V, V$_{IN}$ = 0V or V$_+$		Full			1	µA

ELECTRICAL CHARACTERISTICS (continued)

(V$_+$ = 2.7V to 3.6V, V$_{IH}$ = 1.6V, V$_{IL}$ = 0.4V, Full = -40℃ to +85℃. Typical values are at V$_+$ = 3V, T$_A$ = +25℃, unless otherwise noted.)

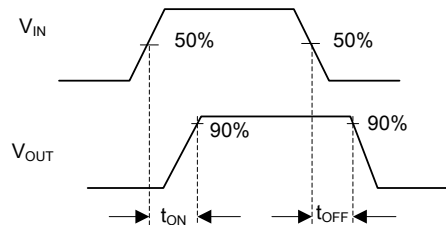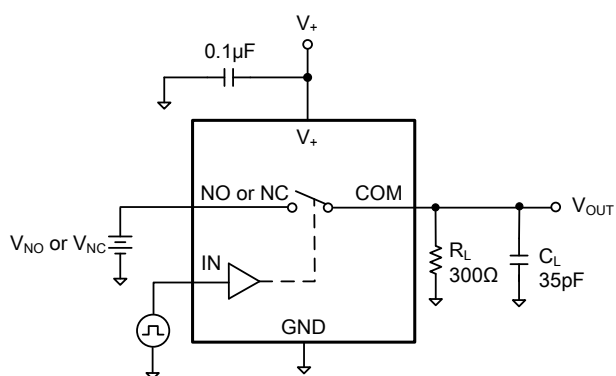| PARAMETER	SYMBOL	CONDITIONS		TEMP	MIN	TYP	MAX	UNITS
Analog Switch								
Analog Signal Range	V$_{NO}$, V$_{NC}$, V$_{COM}$			Full	0		V$_+$	V
On-Resistance	R$_{ON}$	V$_+$ = 2.7V, 0V ≤ V$_{NO}$ or V$_{NC}$ ≤ V$_+$, I$_{COM}$ = -10mA, Test Circuit 1		+25℃		10	15	Ω
				Full			18	
On-Resistance Match between Channels	ΔR$_{ON}$	V$_+$ = 2.7V, 0V ≤ V$_{NO}$ or V$_{NC}$ ≤ V$_+$, I$_{COM}$ = -100mA, Test Circuit 1		+25℃		1	3	Ω
				Full			4	
On-Resistance Flatness	R$_{FLAT(ON)}$	V$_+$ = 2.7V, 0V ≤ V$_{NO}$ or V$_{NC}$ ≤ V$_+$, I$_{COM}$ = -100mA, Test Circuit 1		+25℃		6	9	Ω
				Full			12	
Source Off Leakage Current	I$_{NC(OFF)}$, I$_{NO(OFF)}$	V$_+$ = 3.6V, V$_{NO}$ or V$_{NC}$ = 3.3V/0.3V, V$_{COM}$ = 0.3V/3.3V		Full			1	µA
Channel On Leakage Current	I$_{NC(ON)}$, I$_{NO(ON)}$, I$_{COM(ON)}$	V$_+$ = 3.6V, V$_{COM}$ = 0.3V/3.3V, V$_{NO}$ or V$_{NC}$ = 0.3V/3.3V or floating		Full			1	µA
Digital Inputs								
Input High Voltage	V$_{INH}$			Full	1.5			V
Input Low Voltage	V$_{INL}$			Full			0.4	V
Input Leakage Current	I$_{IN}$	V$_+$ = 2.7V, V$_{IN}$ = 0V or 2.7V		Full			1	µA
Dynamic Characteristics								
Turn-On Time	t$_{ON}$	V$_{NC}$ or V$_{NO}$ = 1.5V, R$_L$ = 300Ω, C$_L$ = 35pF, Test Circuit 2		+25℃		34		Ns
Turn-Off Time	t$_{OFF}$			+25℃		40		Ns
Break-Before-Make Time Delay	t$_D$	V$_{NC}$ or V$_{NO}$ = 1.5V, R$_L$ = 300Ω, C$_L$ = 35pF, Test Circuit 4		+25℃		20		Ns
Charge Injection	Q	V$_G$ = GND, R$_G$ = 0Ω, C$_L$ = 1.0nF, Q = C$_L$ × V$_{OUT}$, Test Circuit 3		+25℃		3.4		pC
Off Isolation	O$_{ISO}$	Signal = 0dBm, R$_L$ = 50Ω, Test Circuit 5	1MHz	+25℃		-75		dB
			10MHz	+25℃		-55		
Channel-to-Channel Crosstalk	X$_{TALK}$	Signal = 0dBm, R$_L$ = 50Ω, Test Circuit 6	1MHz	+25℃		-100		dB
			10MHz	+25℃		-60		
-3dB Bandwidth	BW	Signal = 0dBm, R$_L$ = 50Ω, Test Circuit 7		+25℃		300		MHz
Channel On Capacitance	C$_{NC(ON)}$, C$_{NO(ON)}$, C$_{COM(ON)}$			+25℃		45		pF

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TYPICAL PERFORMANCE CHARACTERISTICS

On Response vs. Frequency

On Response vs. Frequency

Response vs. Frequency

Response vs. Frequency

TEST CIRCUITS

$R_{ON} = V1/100mA$
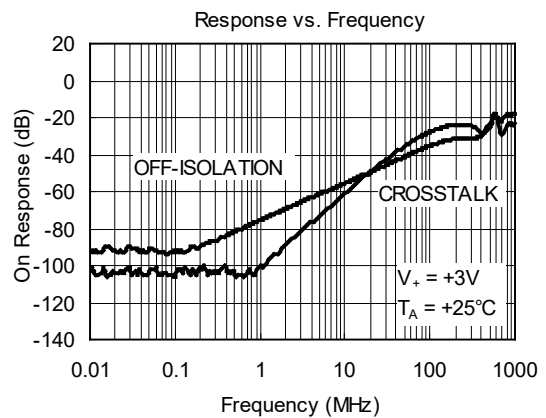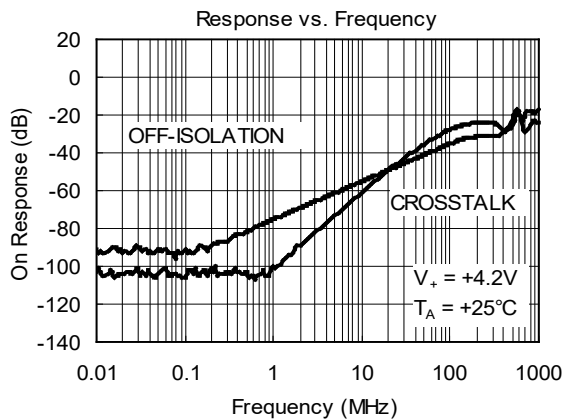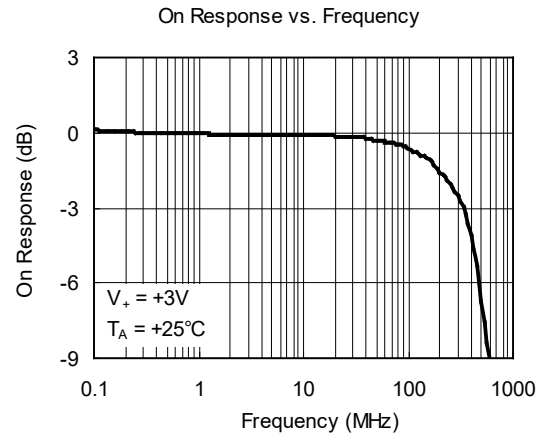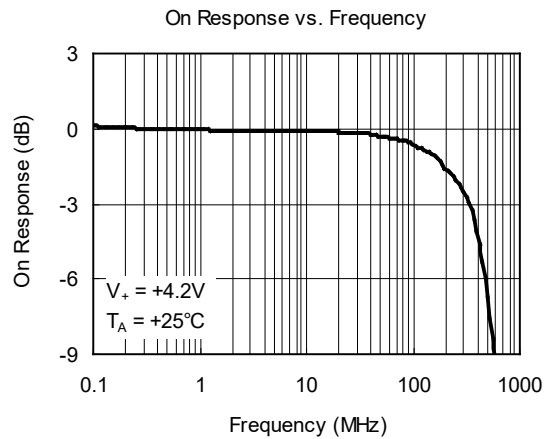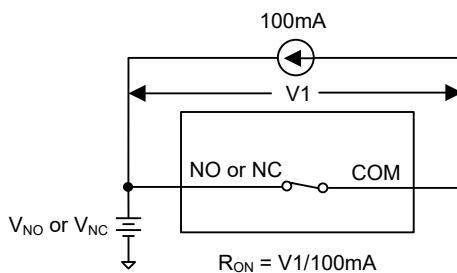
Test Circuit 1. On Resistance

Test Circuit 2. Switching Times (t_{ON}, t_{OFF})

$Q = C_L \times \Delta V_{OUT}$
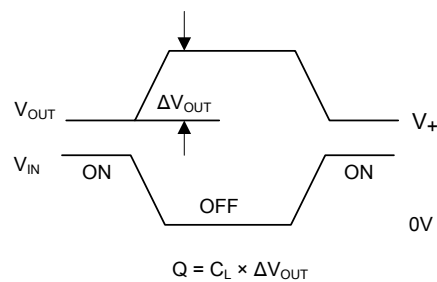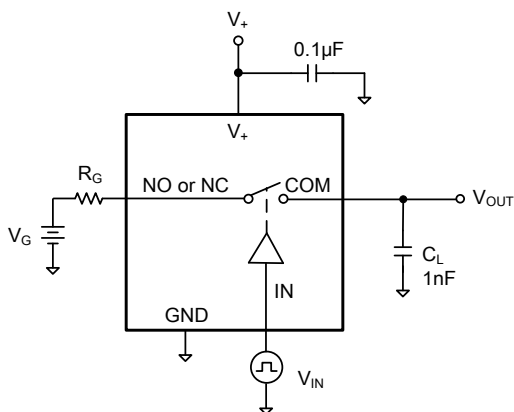
Test Circuit 3. Charge Injection

TEST CIRCUITS (continued)
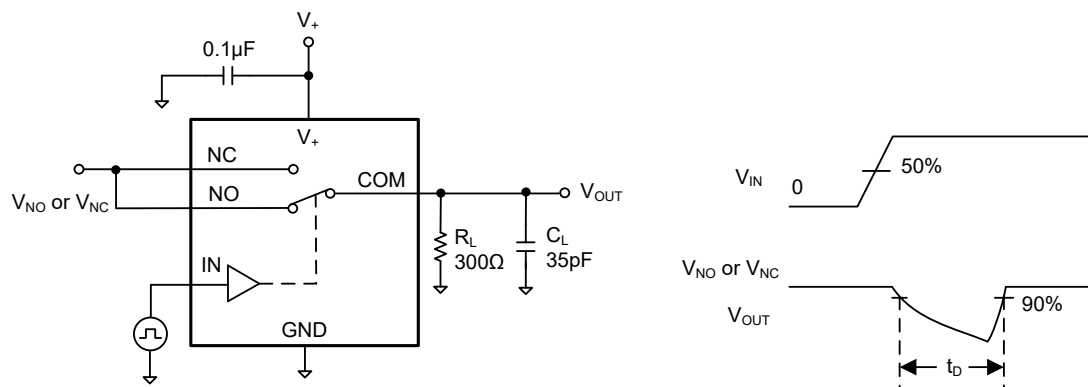
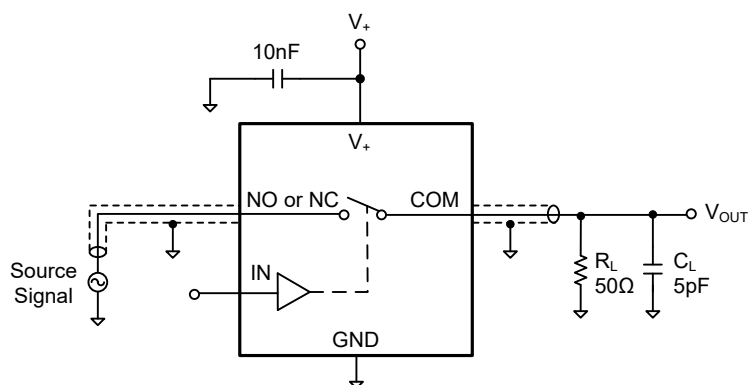**Test Circuit 4. Break-Before-Make Time Delay (t_D)**
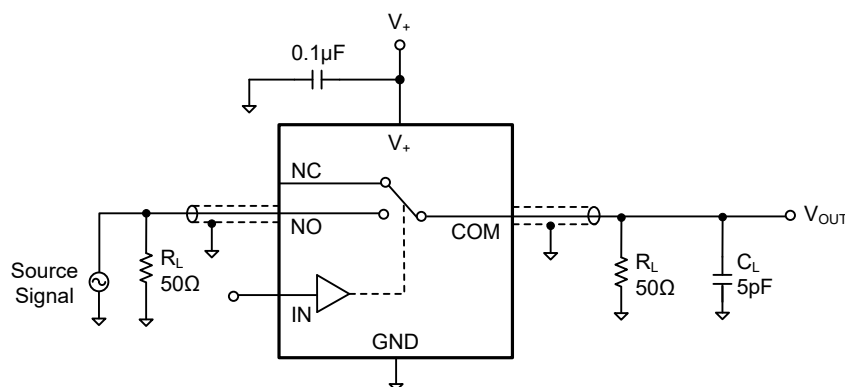
Test Circuit 5. Off Isolation
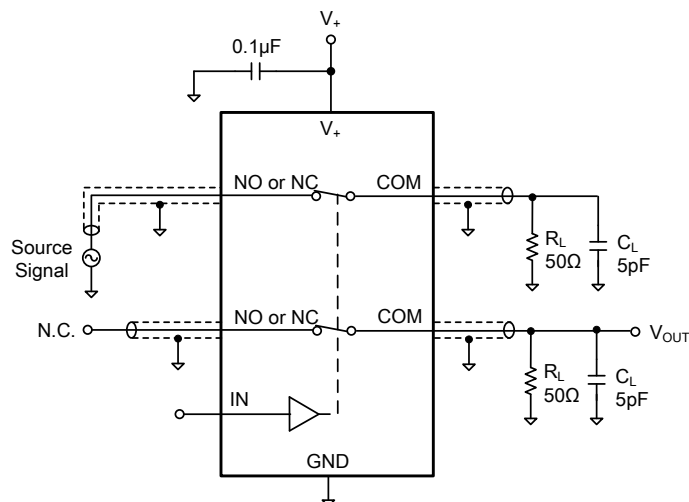
$$\text{Channel To Channel Crosstalk} = -20 \times \log\frac{V_{NO} \text{ or } V_{NC}}{V_{OUT}}$$

Test Circuit 6. Channel-to-Channel Crosstalk

TEST CIRCUITS (continued)
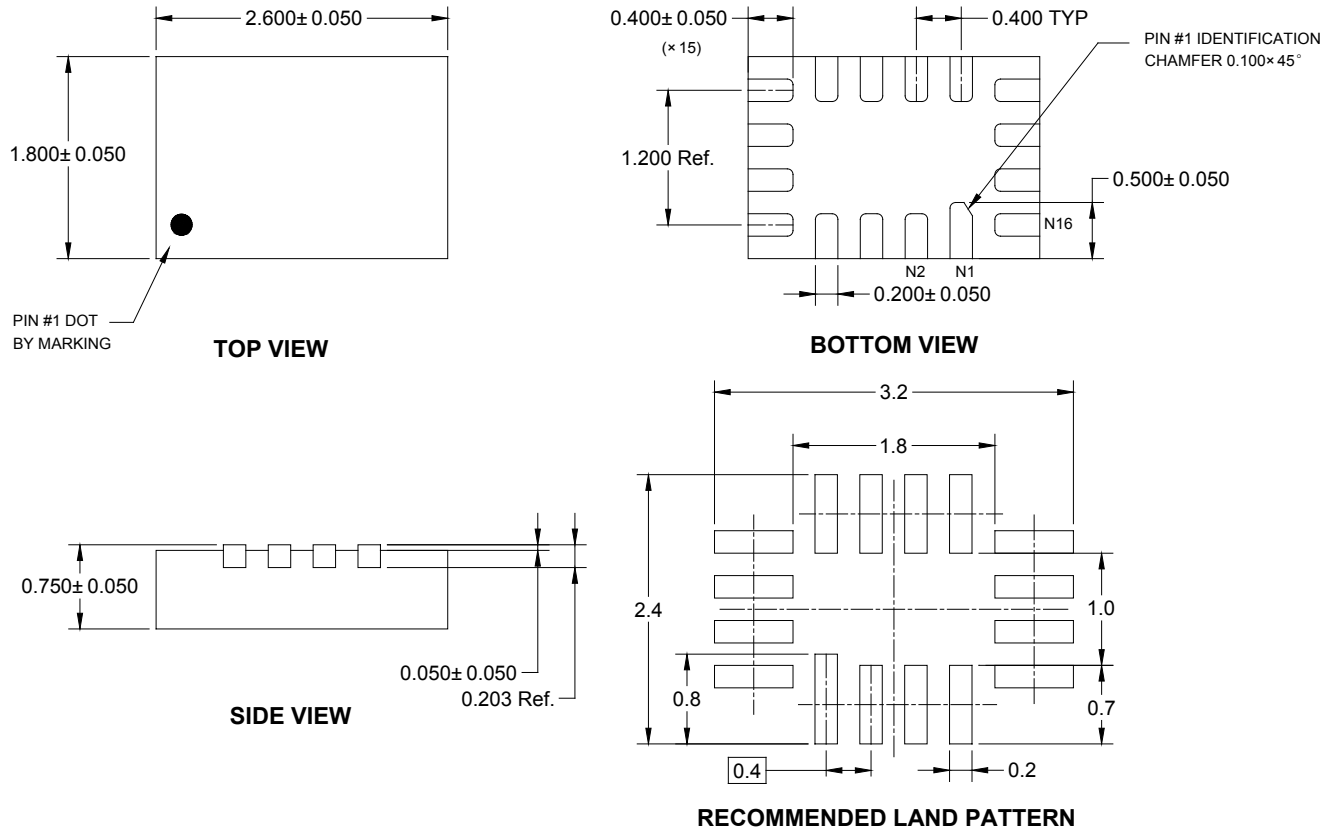

Test Circuit 7. -3dB Bandwidth

REVISION HISTORY

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

PACKAGE OUTLINE DIMENSIONS

TQFN-2.6×1.8-16L

2.600± 0.050

1.800± 0.050

PIN #1 DOT
BY MARKING

TOP VIEW

0.400± 0.050
(× 15)

0.400 TYP

PIN #1 IDENTIFICATION
CHAMFER 0.100× 45°

1.200 Ref.

0.500± 0.050

N16

N2   N1

0.200± 0.050

BOTTOM VIEW

0.750± 0.050

0.050± 0.050
0.203 Ref.

SIDE VIEW

3.2

1.8

2.4

1.0

0.8

0.7

0.4

0.2

RECOMMENDED LAND PATTERN

NOTE: All linear dimensions are in millimeters.

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TX00078.001

TAPE AND REEL INFORMATION

REEL DIMENSIONS

TAPE DIMENSIONS
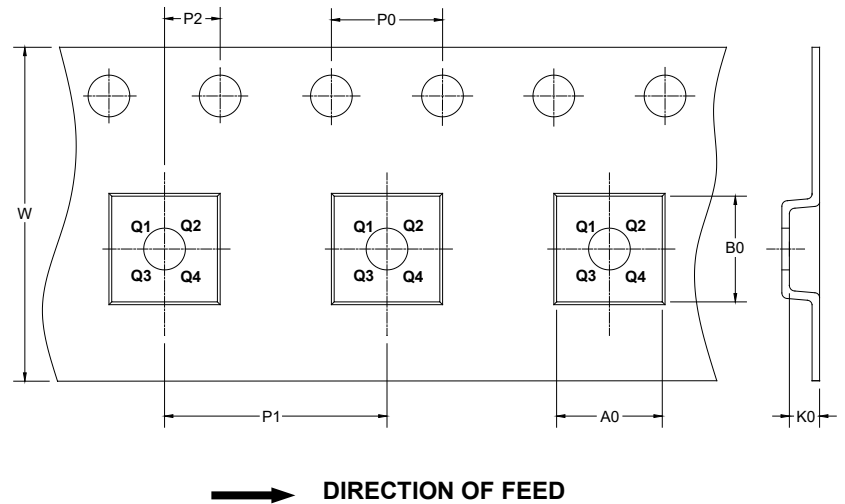
DIRECTION OF FEED

NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
TQFN-2.6×1.8-16L	7″	9.0	2.01	2.81	0.93	4.0	4.0	2.0	8.0	Q1

DD0001

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CARTON BOX DIMENSIONS

NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
7″ (Option)	368	227	224	8
7″	442	410	224	18

DD0002

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