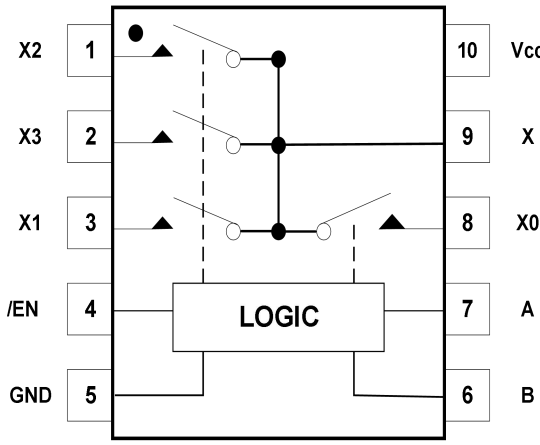


GT4855

CMOS 4-Channel Analog Multiplexer/Demultiplexer

1 Features	2 Application
<ul style="list-style-type: none"> - High bandwidth: 420MHz - High off-Isolation: -84dB(RL=50 Ω, f=1MHZ) - Supply range: +2.5V to +5.5V - Low on-state resistance: 12Ω @4.5V - Break-before-make switching - Binary address decoding on chip - Operation temperature range: -40°C to +125°C - Micro size packages: MSOP10 	<ul style="list-style-type: none"> - Sensors - Analog and digital multiplexing and demultiplexing - A/D and D/A conversion - Signal gating - Battery-operated equipment - Factory automation - Communications circuits - Appliances

3 Description	Circuit Diagram
<p>The GT4855 is a CMOS analog IC configured as 4-channel multiplexers. This CMOS device can operate from 2.5 V to 5.5 V.</p> <p>The GT4855 device are digitally-controlled analog switches. It has low on-resistance (12Ω TYP) and very low off-leakage current (1nA TYP).</p> <p>The GT4855 is available in Green MSOP10 packages. It operates over an ambient temperature range of -40°C to +125°C.</p>	 <p>The circuit diagram illustrates the internal structure of the GT4855. It features four input channels labeled X2 (pin 1), X3 (pin 2), X1 (pin 3), and X0 (pin 8). The outputs are labeled Vcc (pin 10), X (pin 9), X0 (pin 8), A (pin 7), and B (pin 6). A central 'LOGIC' block is connected to control inputs /EN (pin 4), A (pin 7), and B (pin 6). The diagram shows three analog switches controlled by the logic, routing signals from the inputs to the outputs.</p>

4 Revision History

Revision	Date	Note
Rev. A0. 1	2024. 07. 09	Original Version
Rev. A1. 0	2024. 10. 12	Official Version

The latest datasheet version should be checked on the GTIC official website, as the company does not actively inform customers about updates to the datasheet.

5 Device Summary, Pin and Packages

Table 5-1. Device Summary⁽¹⁾

Serial Name	Part Name	Package	Body Size (Nom)	Marking ⁽²⁾⁽⁴⁾	MSL ⁽³⁾	Package Qty
GT4855	GT4855MA	MSOP10	3.00mm×3.00mm×0.90mm	GT4855 XXXXXXX	3	Tape and Reel,3000

(1) For all available packages, please contact product sales.

(2) There may be additional marking, which relates to the lot trace code information (data code and vendor code), the logo or the environmental category on the device.

(3) MSL, The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications.

(4) "XXXXX" in Marking will be appeared as the batch code.

5 Device Summary, Pin and Packages(Continued)

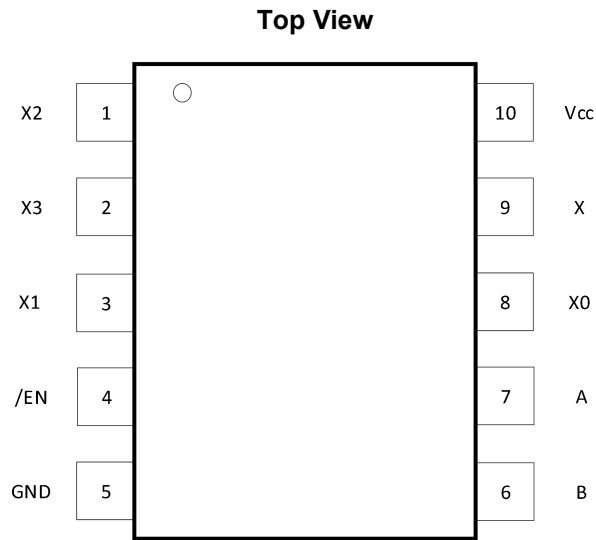


Fig.5-1. GT4855: MA (MSOP10) Package

Table 5-2 Pin Definition

Pin		Description
Name	PE TE	
X2	1	Analog Switch Normally Open Inputs 2.
X3	2	Analog Switch Normally Open Inputs 3.
X1	3	Analog Switch Normally Open Inputs 1.
/EN	4	Inhibit. Drive /EN low or connect to GND for normal operation. Drive /EN high or connect to Vcc to turn all switches off.
GND	5	Ground
B	6	Digital Address "B" Input.
A	7	Digital Address "A" Input.
X0	8	Analog Switch Normally Open Inputs 0.
X	9	Analog Switch Common.
Vcc	10	Power Supply

5 Device Summary, Pin and Packages(Continued)

Table 5-3 Function Table

/EN Input	Input Status		ON Channel(s)
	B	A	
1	X	X	NONE
0	0	0	X-X0
0	0	1	X-X1
0	1	0	X-X2
0	1	1	X-X3

X=Don' t care

NOTE: Input and output pins are identical and interchangeable. Either may be considered an input or output; signals pass equally well in either direction.

6 Voltage, Temperature, ESD and Thermal Ratings

6.1 Absolute Maximum Ratings⁽¹⁾

Parameters		Min.	Max.	Unit
V _{CC}	Supply voltage range	-0.3	6.0	V
V _{IN}	Input voltage(All inputs)	-0.3	(V _{CC})+0.3	V
I _{IN}	Switch input current	-20	+20	mA
I _{PEAK}	Peak switch current	-40	+40	mA
T _J	Junction temperature under bias		150	°C
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 input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed. 6 Voltage, Temperature, ESD and Thermal Ratings(Continued).

6.2 ESD Ratings

ESD		Value	Unit	
V(ESD)	Electrostatic discharge	Human-Body Model (HBM) ⁽¹⁾	6K	V
		Charged-Device Model (CDM) ⁽²⁾	2K	V

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.

(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

6 Voltage, Temperature, ESD and Thermal Ratings(Continued)

6.3 Recommended Operating Conditions⁽¹⁾

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

Symbol	Parameter	Min	Max	Units
V _{CC}	Supply voltage	2.5	5.5	V
T _A	Ambient temperature	-40	125	°C

(1) All unused digital inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

6.4 Thermal Information

Package Type	θ_{JA}	θ_{JC}	Unit
MSOP10	180.7	66.2	°C/W

7 Electrical Specifications

7.1 DC Electrical Characteristics

V_{CC}=2.5V to 5.5V, FULL=-40°C to +125°C. Typical values are at TA=+25°C (unless otherwise noted)

Parameter	Symbol	Conditions	V _s	Temp	Min	Typ	Max	Units
Analog Switch								
Analog Signal Range	V _X -, V _X				0		V _{CC}	V
On-Resistance	R _{ON}	I _X =10mA	4.5V	+25°C		12	14	Ω
				Full			16	Ω
			3V	+25°C		27	30	Ω
				Full			32	Ω
On-Resistance Match Between Channels	Δ R _{ON}	I _X =10mA	4.5V	+25°C		0.3	0.5	Ω
				Full			0.8	Ω
			3V	+25°C		0.3	0.5	Ω
				Full			0.8	Ω
On-Resistance Flatness	R _{FLAT} (ON)	I _X =10mA	4.5V	+25°C		4	6	Ω
				Full			8	Ω
			3V	+25°C		17	20	Ω
				Full			23	Ω
X _i , X _i Off, X _i On Leakage Current	I _{X(OFF)} , I _{X(OFF)} , I _{X(ON)}	V _X -=0V, 4.5V, V _X =4.5V, 0V	5.5V	+25°C		1	100	nA
		V _X -=1V, 3V, V _X =1V, 3V	3.6V	+25°C		1	100	nA
Digital Control Inputs								
Logic Input Logic Threshold High	V _{AH} , V _{BH} , V _{IENH}		5V	+25°C				V
			3.3V					1.2
Logic Input Logic Threshold Low	V _{AL} , V _{BL} , V _{IENL}		5V	+25°C				0.7
			3.3V					0.5
Input-Current High	I _{AH} , I _{BH} , I _{IENH}	V _A , V _B , V _{IEN} =V _{CC}	3.6 to 5.5V	+25°C		1	100	nA
Input-Current Low	I _{AL} , I _{BL} , I _{IENL}	V _A , V _B , V _{IEN} =0V	3.6 to 5.5V	+25°C		1	100	nA

(1) All unused digital inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

7 Electrical Specifications(Continued)

7.2 Switch And AC Characteristics

V_{CC}=2.5V to 5.5V, FULL=-40°C to +125°C. Typical values are at TA=+25°C (unless otherwise noted)

Parameter	Symbol	Conditions	V ₊	Temp	Min	Typ	Max	Units
Address Transition Time	t _{TRANS}	V _X =3V/0V, R _L =300Ω, C _L =35pF	5V	+25°C		30		ns
		V _X =3V/0V, R _L =300Ω, C _L =35pF	3.3V			95		ns
Turn-On Time	t _{ON}	V _X =3V, R _L =300Ω, C _L =35pF	5V	+25°C		28		ns
			3.3V			89		ns
Turn-Off Time	t _{OFF}	V _X =3V, R _L =300Ω, C _L =35pF	5V	+25°C		5		ns
			3.3V			8		ns
Input Transition RiseTime	t _R	V _X =3V, R _L =300Ω, C _L =35pF	5V	+25°C		8		ns
			3.3V			65		ns
Input Transition Fall Time	t _F	V _X =3V, R _L =300Ω, C _L =35pF	5V	+25°C		41		ns
			3.3V			40		ns
Break-Before-Make Time Delay	t _D	V _X =3V, R _L =300Ω, C _L =35pF	5V	+25°C		11		ns
			3.3V			37		ns
Charge Injection	Q	R _S =0Ω, C _L =1nF	5V	+25°C		14		pC
		R _S =0Ω, C _L =1nF	3.3V			10		pC
Channel-to-Channel Crosstalk	XTALK	f=1MHZ	5V	+25°C		-85		dB
			3.3V			-85		dB
Off Isolation	O _{ISO}	R _L =50Ω, f=1MHZ	5V	+25°C		-84		dB
			3.3V			-84		dB
-3dB Bandwidth	BW	R _L =50Ω	5V	+25°C		420		MHZ
			3.3V			400		MHZ
Input Off-Capacitance	C _{X(OFF)}	f=1MHz	5V	+25°C		10		pF
Output Off-Capacitance	C _{X(OFF)}	f=1MHz	5V	+25°C		6		pF
Output On-Capacitance	C _{X(ON)}	f=1MHz	5V	+25°C		3		pF
Total Harmonic Distortion	THD	R _L =600Ω, 5V _{P-P} , f=20Hz to 20kHz	5V	+25°C		0.06		%
Power Supply Range	V _{CC}			Full	2.5		5.5	V
Power Supply Current	I _{CC}	V _A , V _B , V _{EN} =V _{CC} or 0	5.5V	+25°C		0.001	2	μA
		V _A , V _B , V _{EN} =V _{CC} or 0	3.6V			0.001	1	μA

8 Typical Characteristics

Vcc=2.5V to 5.5V, FULL=-40°C to +125°C. Typical values are at TA=+25°C (unless otherwise noted)

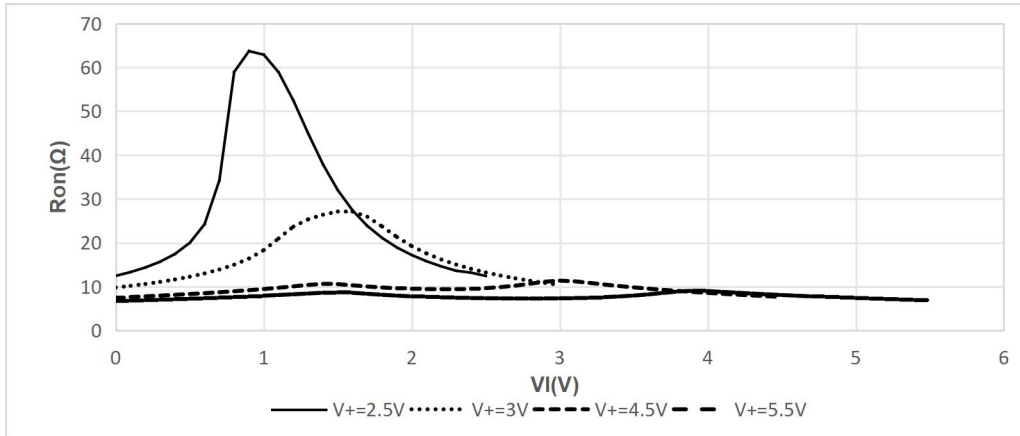


Fig.8-1.Ron VS Input Voltage

9 Measurement Information

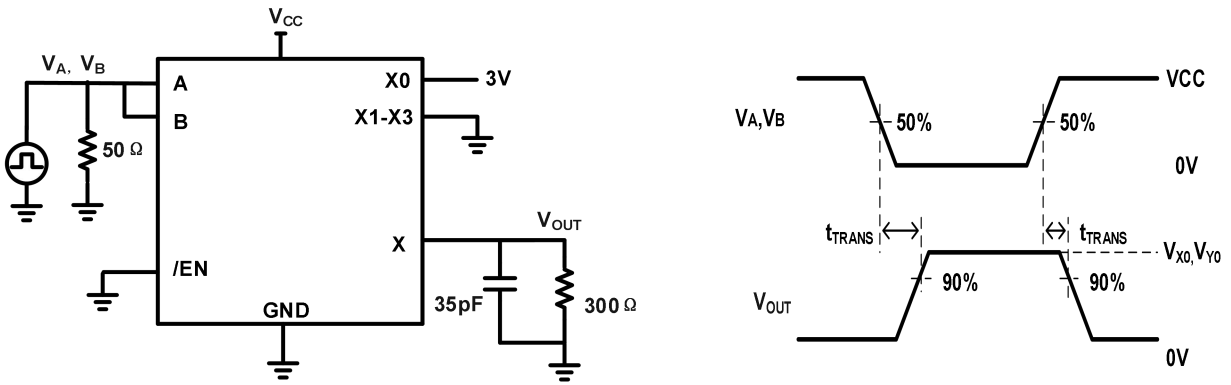


Fig.9-1. Address Transition Times (t_{TRANS})

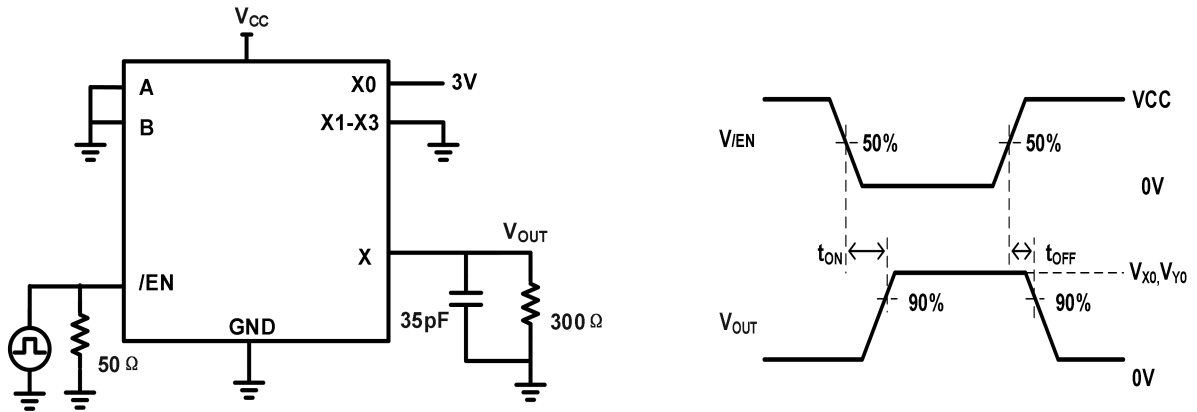


Fig.9-2. Switching Times (t_{ON}, t_{OFF})

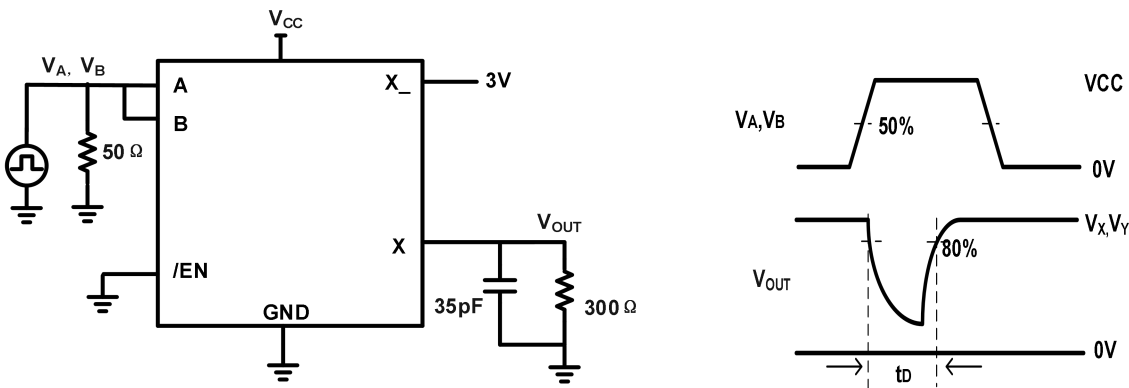


Fig.9-3. Break-Before-Make Time Delay (t_D)

9 Measurement Information(Continued)

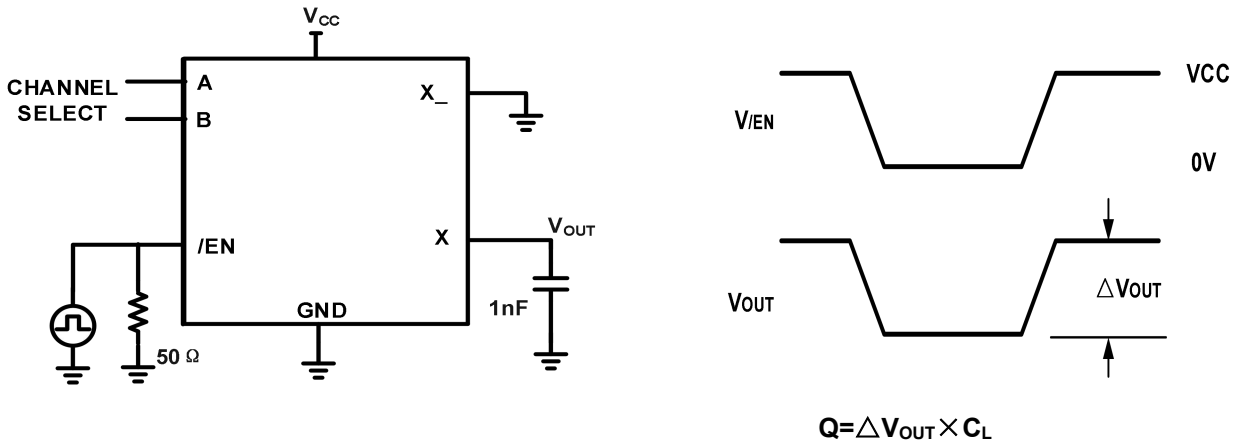


Fig.9-4. Charge Injection (Q)

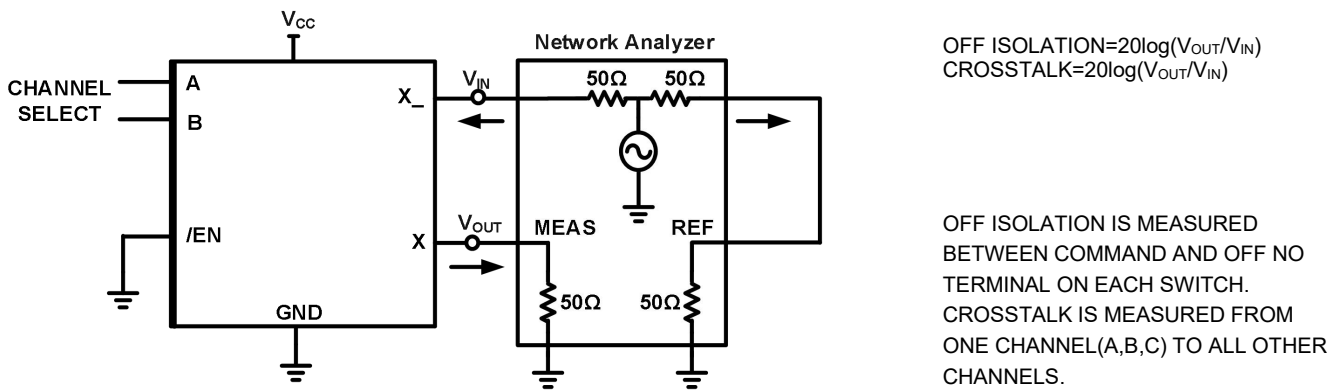


Fig.9-5. Off Isolation and Crosstalk

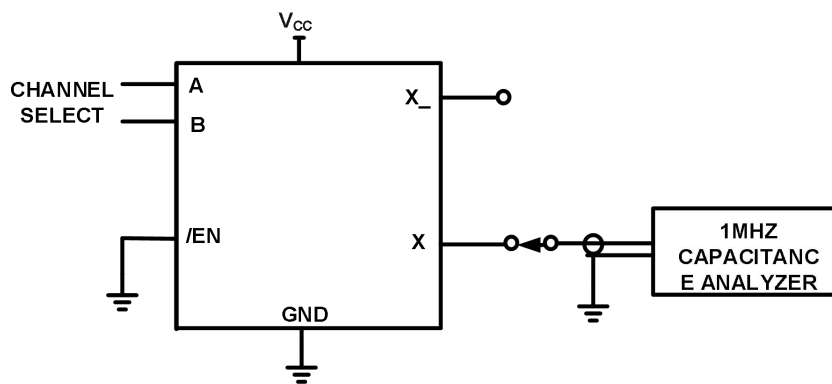
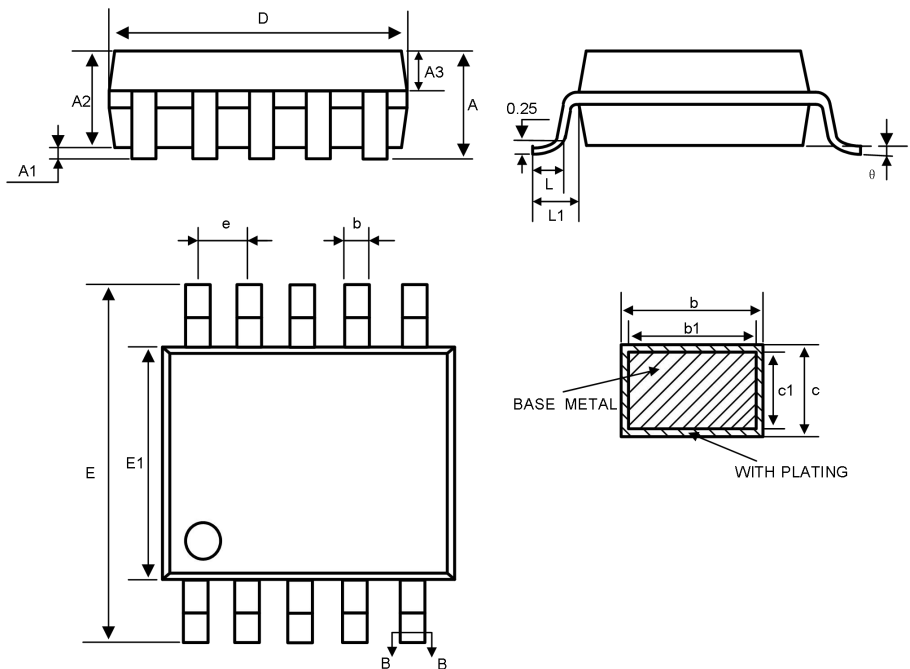


Fig.9-6. Capacitance

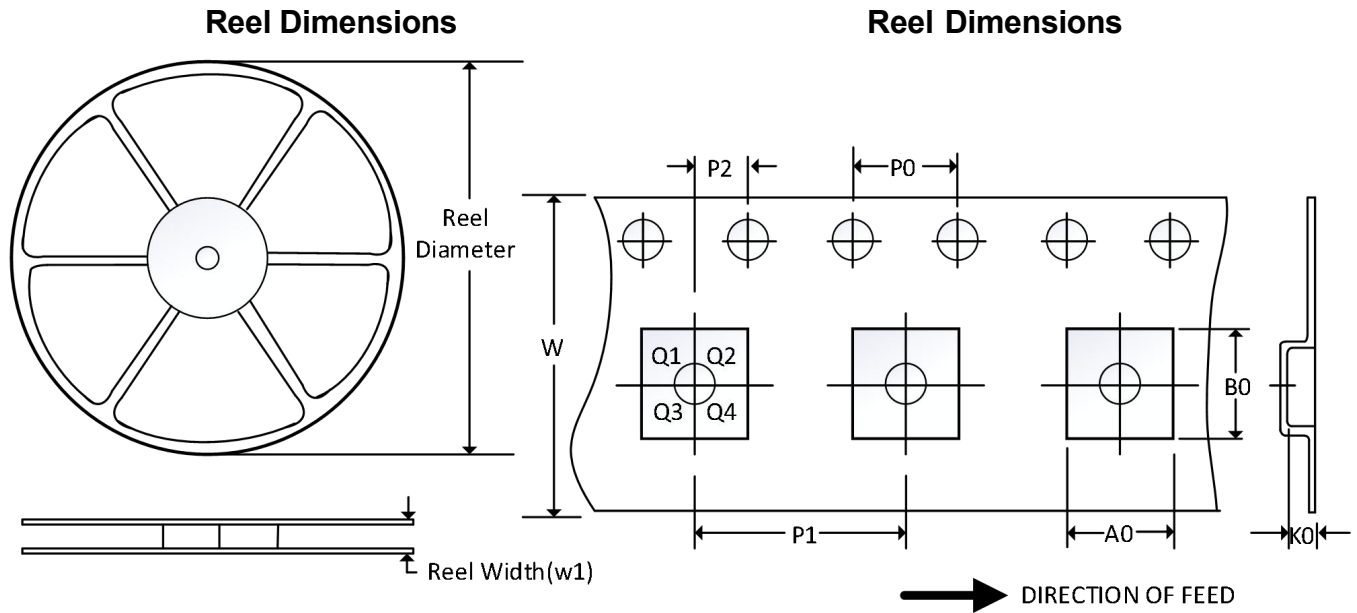
10 Package Outline Dimension

MSOP10



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	—	—	1.10	—	—	0.043
A1	0.05	—	0.15	0.002	—	0.006
A2	0.75	0.85	0.95	0.030	0.033	0.037
A3	0.30	0.35	0.40	0.012	0.014	0.016
b	0.18	—	0.26	0.007	—	0.010
b1	0.17	0.20	0.23	0.007	0.008	0.009
c	0.15	—	0.19	0.006	—	0.007
c1	0.14	0.15	0.16	0.006	0.006	0.006
D	2.90	3.00	3.10	0.114	0.118	0.122
E	4.70	4.90	5.10	0.185	0.193	0.201
E1	2.90	3.00	3.10	0.114	0.118	0.122
e	0.50BSC			0.02BSC		
L	0.40	—	0.70	0.016	—	0.028
L1	0.95REF			0.037REF		
θ	0	—	8°	0	—	8°

11 Tape and Reel Information



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(mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
MSOP10	13"	12.4	5.2	3.3	1.2	4	8	2	12	Q1

NOTE:

1. All dimensions are nominal.
2. Plastic or metal protrusions of 0.15mm maximum per side are not included.