

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM8709	SOT-23-5	-40°C to +85°C	SGM8709YN5G/TR	SBBXX	Tape and Reel, 3000
	SC70-5	-40°C to +85°C	SGM8709YC5G/TR	SA5XX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XX = Date Code.

SOT-23-5/SC70-5

YYY X X

Date Code - Month

Date Code - Year

Serial Number

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

Supply Voltage, +V _S to -V _S	6V
V _{IN} Differential	±2.5V
Voltage at Input Pins	(-V _S) - 0.3V to (+V _S) + 0.3V
Voltage at Output Pin	6V
Junction Temperature	+150°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10s)	+260°C
ESD Susceptibility	
HBM	2000V
MM	400V

RECOMMENDED OPERATING CONDITIONS

Operating Temperature Range	-40°C to +85°C
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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

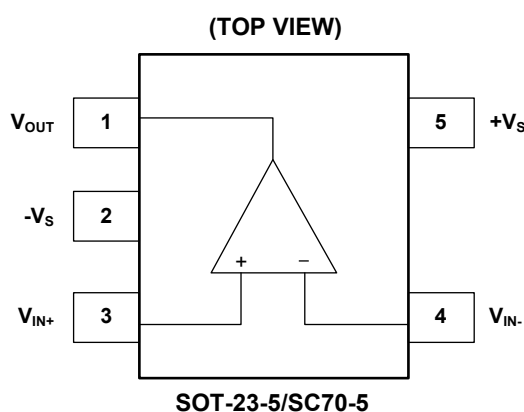
This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures

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.

PIN CONFIGURATIONS



ELECTRICAL CHARACTERISTICS

(At $T_A = +25^\circ\text{C}$, $+V_S = 1.4\text{V}$, $-V_S = 0\text{V}$, $V_{CM} = +V_S/2$, $V_{OUT} = -V_S$ and $R_L = 20\text{k}\Omega$ connected to $+V_S$, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Supply Current	I_S	$V_{CM} = 0.3\text{V}$		318	1000	nA
		$V_{CM} = 1.1\text{V}$		263	1000	
Input Offset Voltage	V_{OS}	$V_{CM} = 0\text{V}$		0.6	3	mV
		$V_{CM} = 1.4\text{V}$		0.4	3	
Input Offset Average Drift				2		$\mu\text{V}/^\circ\text{C}$
Common Mode Rejection Ratio	CMRR	V_{CM} stepped from 0V to 0.3V		61		dB
		V_{CM} stepped from 0.8V to 1.4V		59		
		V_{CM} stepped from 0V to 1.4V		67		
Power Supply Rejection Ratio	PSRR	$V_S = 1.8\text{V}$ to 5.5V , $V_{CM} = 0\text{V}$		87		dB
Open-Loop Voltage Gain	A_{OL}			81		dB
Output Voltage Swing from Rail	V_{OL}	$V_S = 1.8\text{V}$, $I_{OUT} = 500\mu\text{A}$		81	106	mV
		$-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$			137	
		$V_S = 1.8\text{V}$, $I_{OUT} = 1\text{mA}$		165	213	
		$-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$			290	
Output Current	I_{OUT}	Sink	0.7	1.8		mA
		$-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$	0.5			
Leakage Current	$I_{Leakage}$	$V_{OUT} = +V_S$		1		nA
Propagation Delay (High to Low)		Overdrive = 10mV		12		μs
		Overdrive = 100mV		6		
Fall Time	t_{Fall}	Overdrive = 10mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$		156		ns
		Overdrive = 100mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$		155		

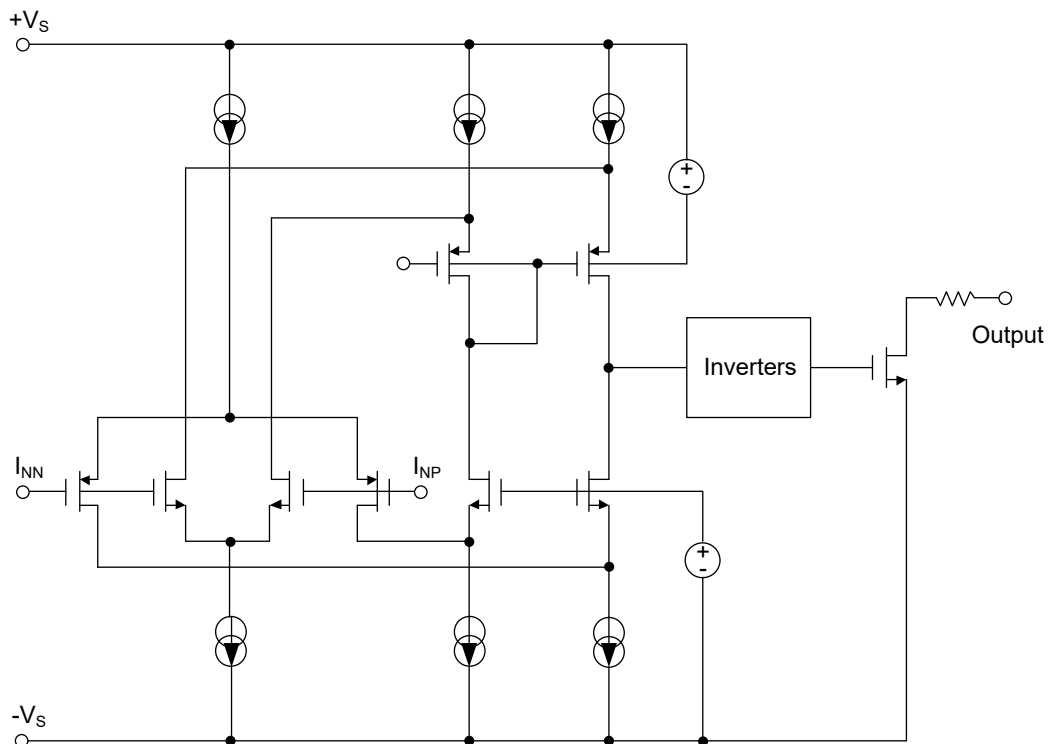
ELECTRICAL CHARACTERISTICS (continued)(At $T_A = +25^\circ\text{C}$, $+V_S = 2.5\text{V}$, $-V_S = 0\text{V}$, $V_{CM} = +V_S/2$, $V_{OUT} = -V_S$ and $R_L = 20\text{k}\Omega$ connected to $+V_S$, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Supply Current	I_S	$V_{CM} = 0.3\text{V}$		330		nA
		$V_{CM} = 2.2\text{V}$		275		
Input Offset Voltage	V_{OS}	$V_{CM} = 0\text{V}$		0.6		mV
		$V_{CM} = 2.5\text{V}$		0.4		
Input Offset Average Drift				2		$\mu\text{V}/^\circ\text{C}$
Common Mode Rejection Ratio	CMRR	V_{CM} stepped from 0V to 1.4V		69		dB
		V_{CM} stepped from 1.9V to 2.5V		68		
		V_{CM} stepped from 0V to 2.5V		72		
Power Supply Rejection Ratio	PSRR	$V_S = 1.8\text{V}$ to 5.5V , $V_{CM} = 0\text{V}$		87		dB
Open-Loop Voltage Gain	A_{OL}			80		dB
Output Voltage Swing from Rail	V_{OL}	$I_{OUT} = 500\mu\text{A}$		66		mV
		$I_{OUT} = 1\text{mA}$		131		
Output Current	I_{OUT}	Sink		7.1		mA
Leakage Current	$I_{Leakage}$	$V_{OUT} = +V_S$		2		nA
Propagation Delay (High to Low)		Overdrive = 10mV		11		μs
		Overdrive = 100mV		5		
Fall Time	t_{Fall}	Overdrive = 10mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$		64		ns
		Overdrive = 100mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$		48		

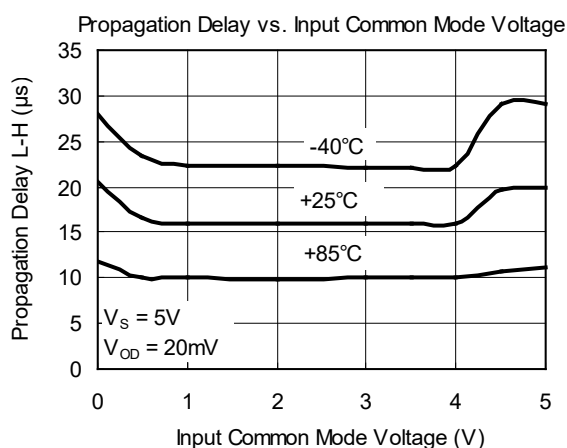
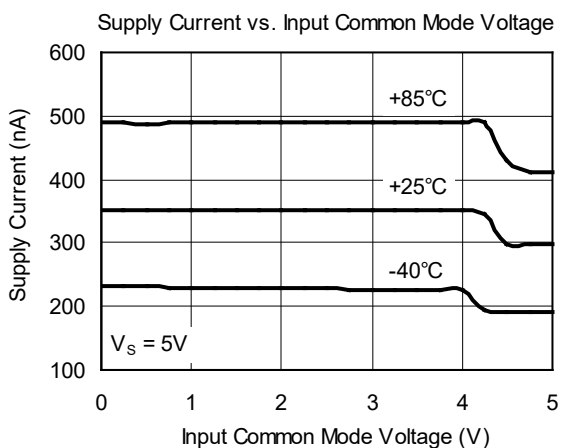
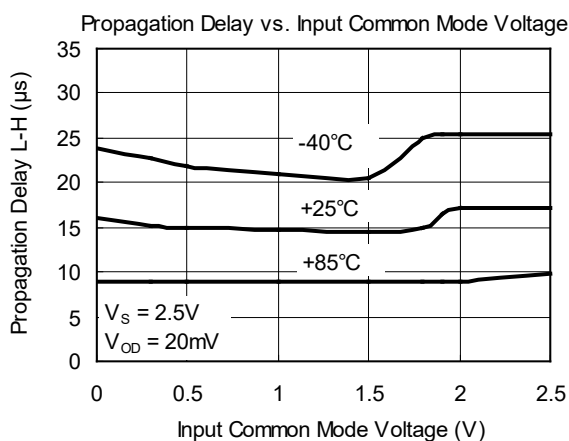
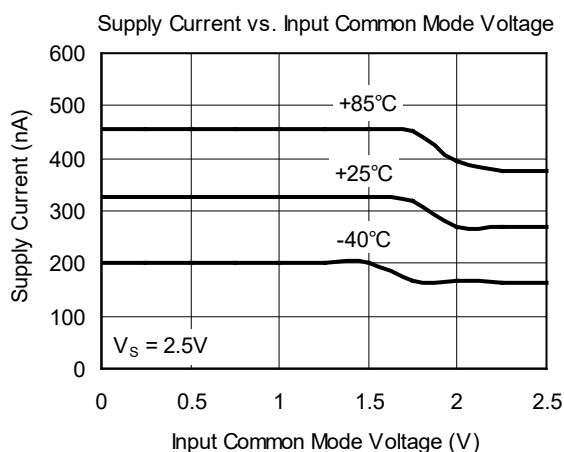
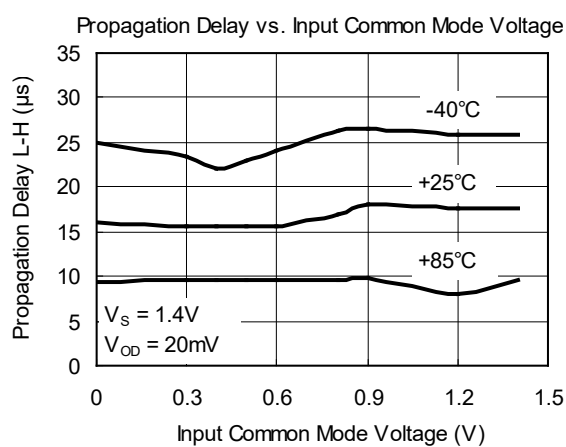
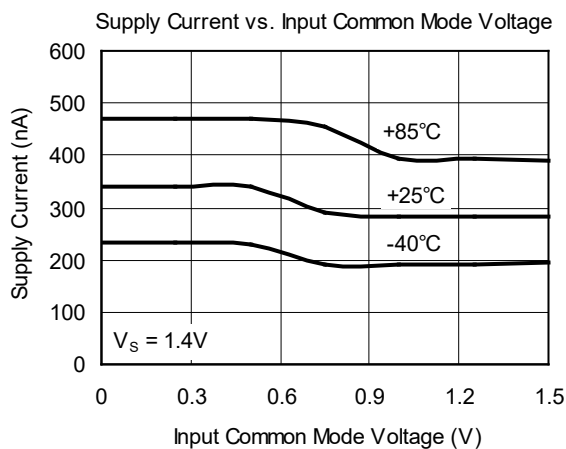
ELECTRICAL CHARACTERISTICS (continued)(At $T_A = +25^\circ\text{C}$, $+V_S = 5.0\text{V}$, $-V_S = 0\text{V}$, $V_{CM} = +V_S/2$, $V_{OUT} = -V_S$ and $R_L = 20\text{k}\Omega$ connected to $+V_S$, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Supply Current	I_S	$V_{CM} = 0.3\text{V}$		366	2000	nA
		$V_{CM} = 4.7\text{V}$		311	2000	
Input Offset Voltage	V_{OS}	$V_{CM} = 0\text{V}$		0.6	3	mV
		$V_{CM} = 5\text{V}$		0.4	3	
Input Offset Average Drift				2		$\mu\text{V}/^\circ\text{C}$
Common Mode Rejection Ratio	CMRR	V_{CM} stepped from 0V to 3.9V		69		dB
		V_{CM} stepped from 4.4V to 5.0V		75		
		V_{CM} stepped from 0V to 5.0V		77		
Power Supply Rejection Ratio	PSRR	$V_S = 1.8\text{V}$ to 5.5V , $V_{CM} = 0\text{V}$		87		dB
Open-Loop Voltage Gain	A_{OL}			81		dB
Output Voltage Swing from Rail	V_{OL}	$I_{OUT} = 500\mu\text{A}$		53	72	mV
		$-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$			92	
		$I_{OUT} = 1\text{mA}$		104	124	
		$-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$			152	
Output Current	I_{OUT}	Sink	15.3	18.7		mA
		$-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$	12.1			
Leakage Current	$I_{Leakage}$	$V_{OUT} = +V_S$		5		nA
Propagation Delay (High to Low)		Overdrive = 10mV		13		μs
		Overdrive = 100mV		5		
Fall Time	t_{Fall}	Overdrive = 10mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$		40		ns
		Overdrive = 100mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$		36		

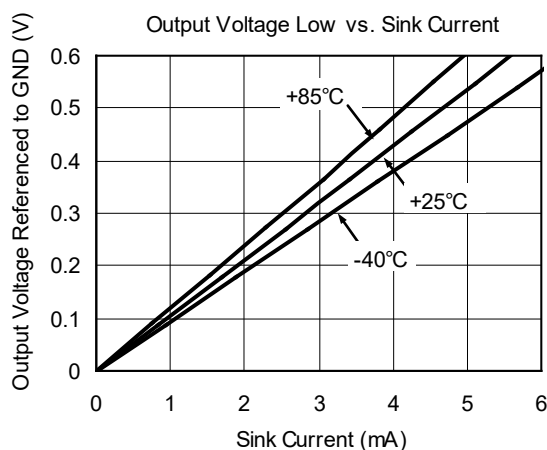
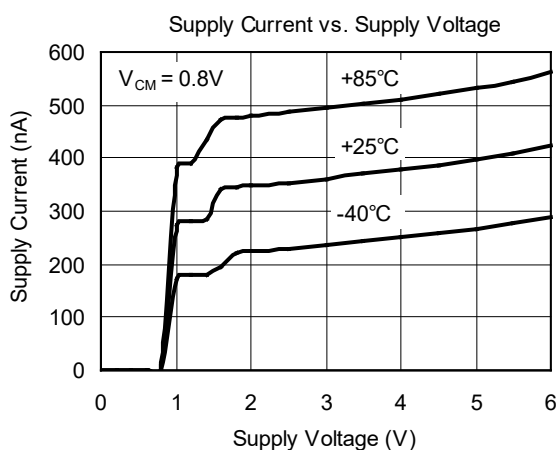
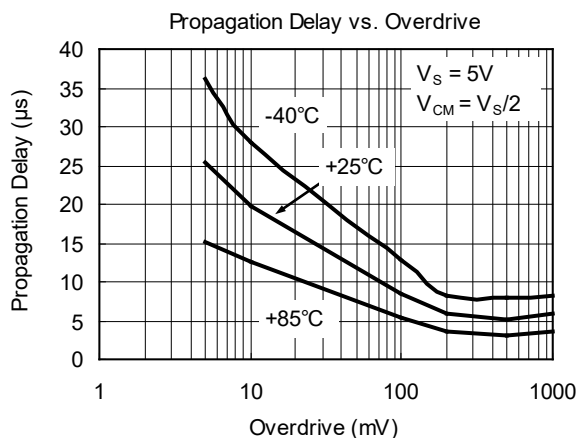
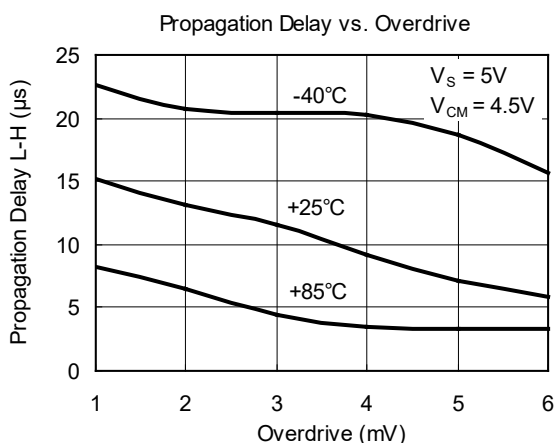
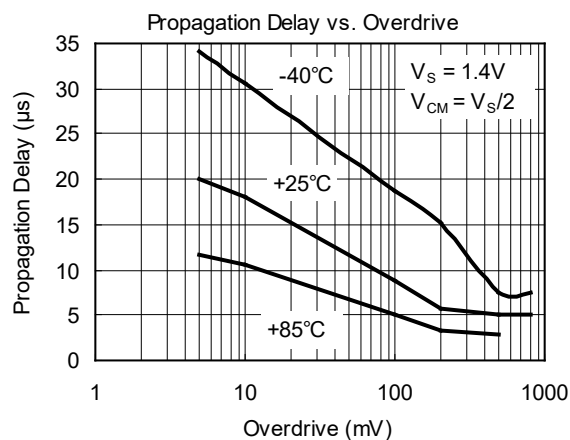
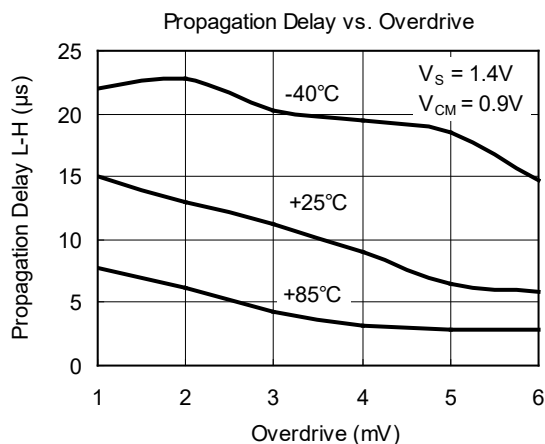
SIMPLIFIED SCHEMATIC DIAGRAM



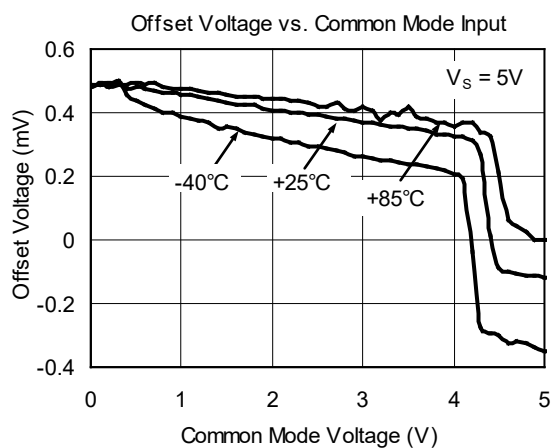
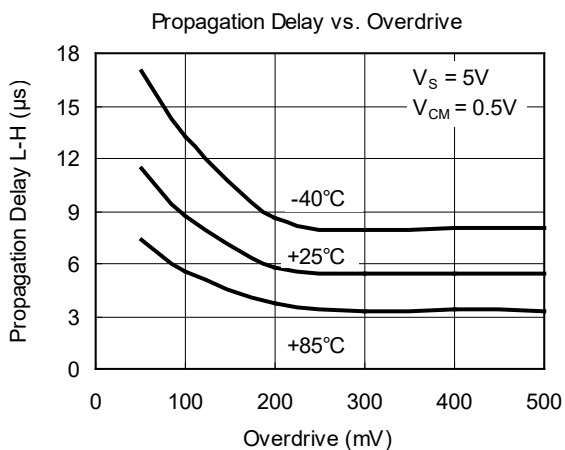
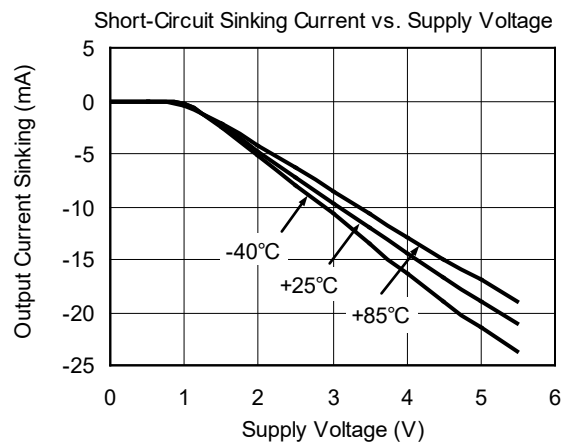
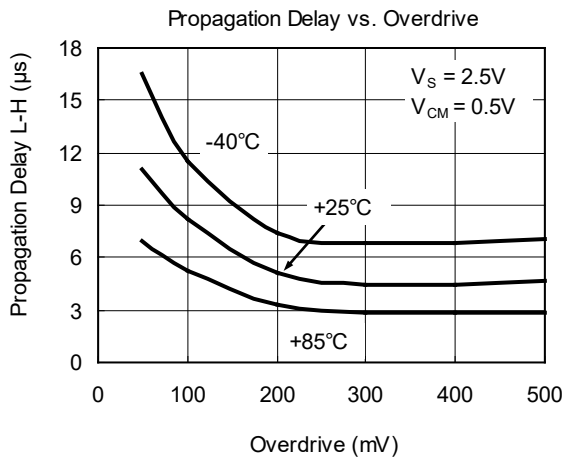
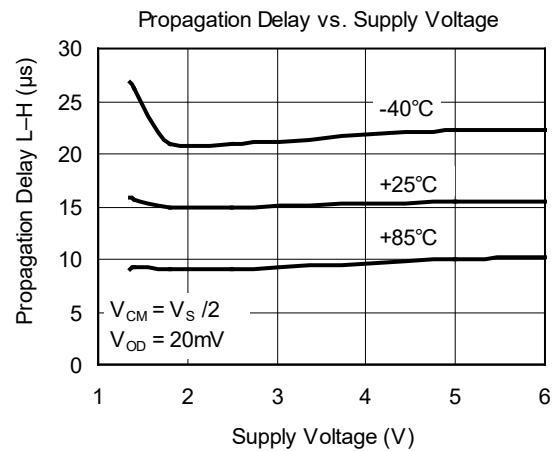
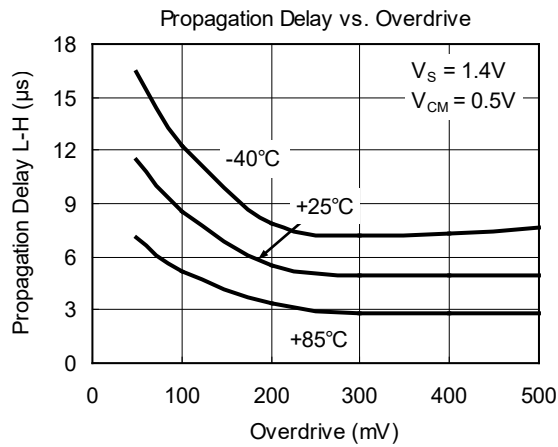
TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



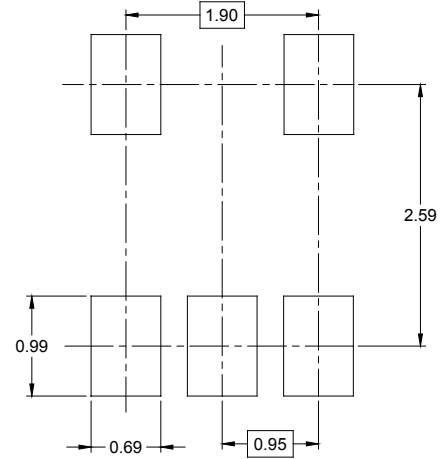
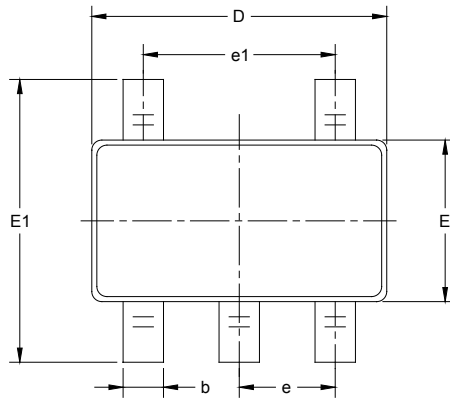
REVISION HISTORY

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

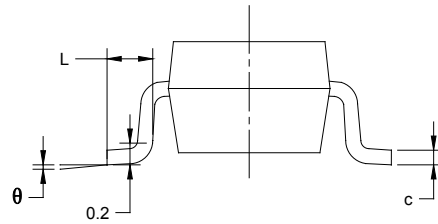
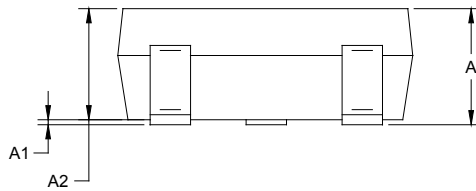
NOVEMBER 2013 – REV.A.1 to REV.A.2		Page
Changed Electrical Characteristics section		4
APRIL 2013 – REV.A to REV.A.1		Page
Added Absolute Maximum Ratings section		2
Changes from Original (SEPTEMBER 2012) to REV.A		Page
Changed from product preview to production data		All

PACKAGE OUTLINE DIMENSIONS

SOT-23-5



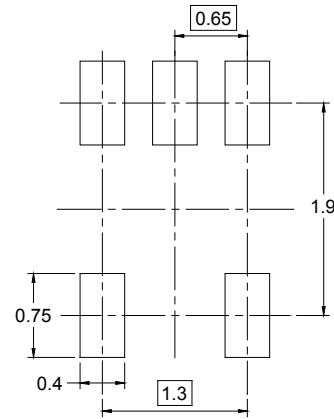
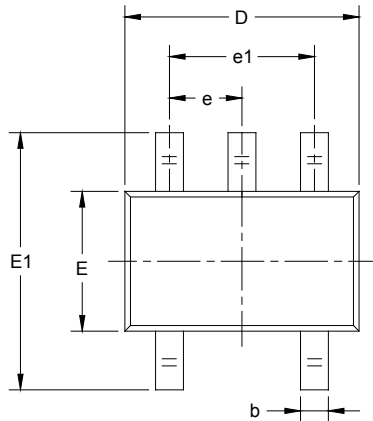
RECOMMENDED LAND PATTERN (Unit: mm)



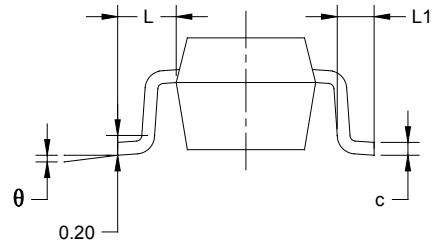
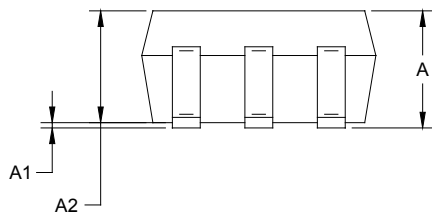
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

PACKAGE OUTLINE DIMENSIONS

SC70-5



RECOMMENDED LAND PATTERN (Unit: mm)

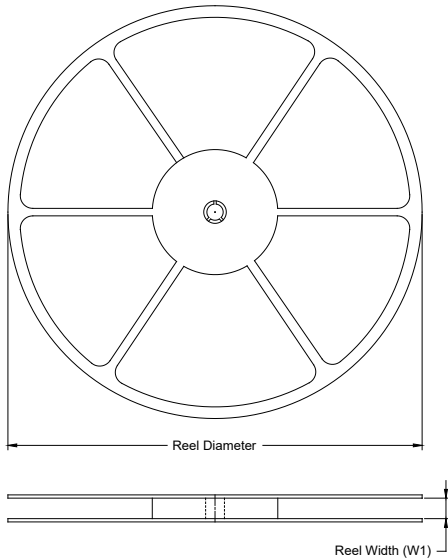


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.65 TYP		0.026 TYP	
e1	1.300 BSC		0.051 BSC	
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

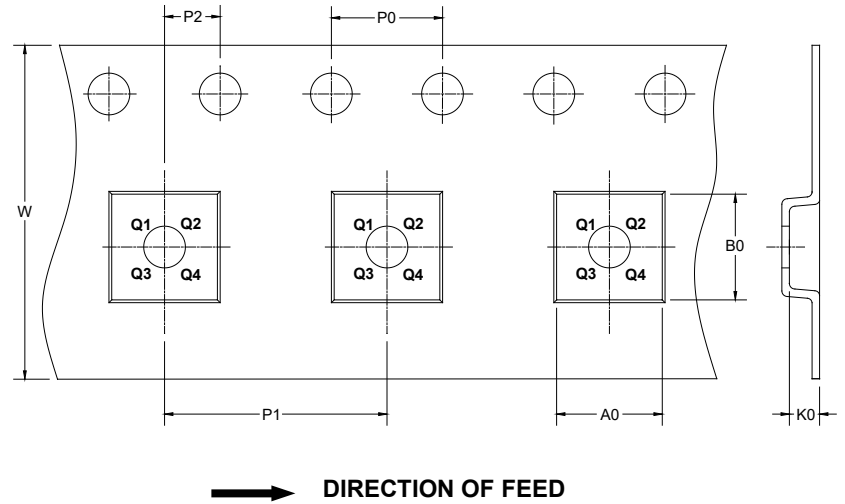
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

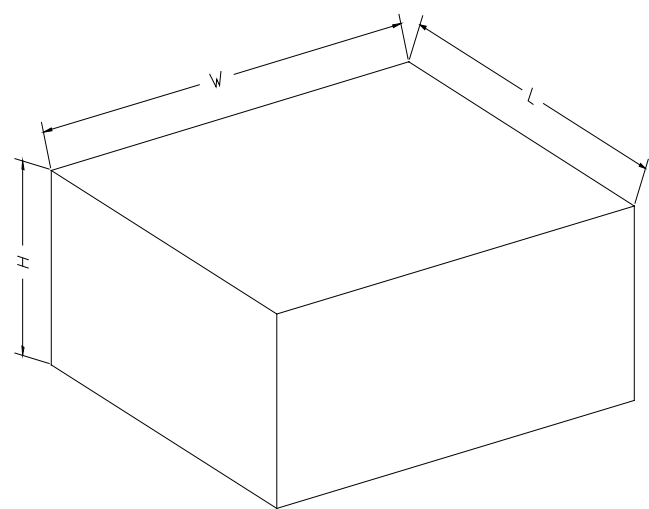
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOT-23-5	7"	9.5	3.20	3.20	1.40	4.0	4.0	2.0	8.0	Q3
SC70-5	7"	9.5	2.25	2.55	1.20	4.0	4.0	2.0	8.0	Q3

DD0001

PACKAGE INFORMATION

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