

### ■ General Description

The AME4620 analog switches feature low ON resistance, single-pole, double-throw (SPDT) with wide operating single power supply voltage range, from 1.8V to 5.5V.

AME4620 has 1Ω max ON resistance when +5V power supply is used. These products also have fast switching speeds,  $t_{ON} = t_{OFF} = 50nS$  max.

AME4620 is available in SC-70-6.

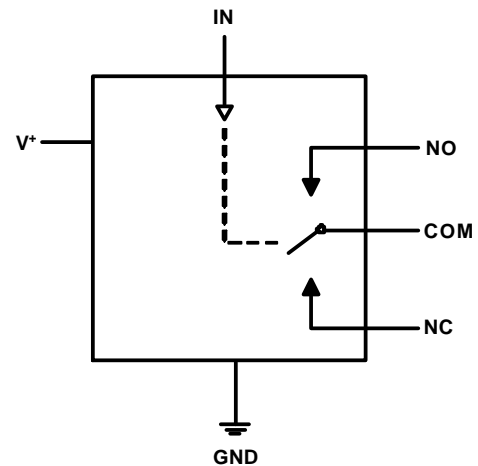
### ■ Features

- Low  $R_{ON}$
- Wide Operation Supply Voltage: 1.8V to 5.5V
- Fast Switching Time:  $t_{ON} = t_{OFF} = 50nS$  max.
- TTL-Logic Compatible
- Pin Compatible with FSA4157
- Over Thermal Protection
- Space saving in SC-70-6
- All AME's Lead Free Products Meet RoHS Standards

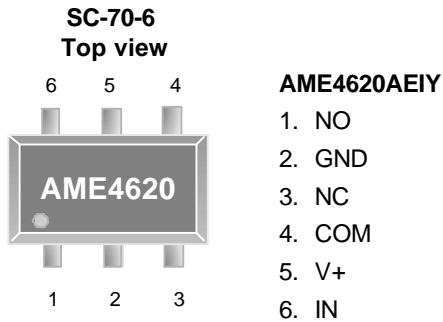
### ■ Applications

- Power Routing
- Battery-Operated Equipment
- Audio and Video Signal Routing
- Low-Voltage Data-Acquisition Systems
- Communications Circuits
- PCMCIA Cards
- PC Peripherals

### ■ Functional Block Diagram



In Logic	NC	NO
0	ON	OFF
1	OFF	ON

**AME4620**
**■ Pin Configuration**


**\* Die Attach:  
Conductive Epoxy**

**■ Pin Description**

Pin Name	Pin Description
IN	Digital Control Input
V+	Positive Supply Voltage Input
GND	Ground
NC	Analog Switch-Normally Closed
COM	Analog Switch-Common
NO	Analog Switch-Normally Open

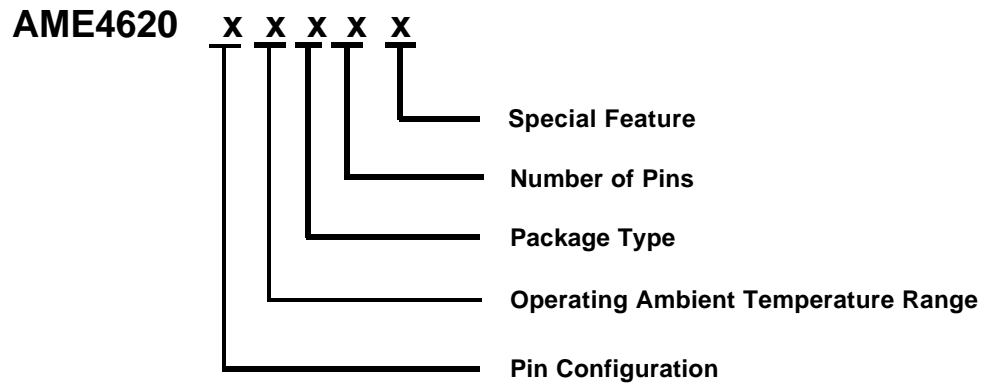
**■ Ordering Information**

Part Number	Marking*	Activity Mode	Package	Operating Ambient Temperature Range
AME4620AEIYZ	BCYw	Break-Before-Make	SC-70-6	- 40°C to 85°C

Note: w represents the date code and pls refer to Date Code Rule before Package Dimension.

\* A line on top of the first letter represents lead free plating such as BCY.

Pls consult AME sales office or authorized Rep./Distributor for the availability of package type.

**AME4620**
**■ Ordering Information**


Pin Configuration	Operating Ambient Temperature Range	Package Type	Number of Pins	Special Feature
A: 1. NO (SC-70-6) 2. GND 3. NC 4. COM 5. V+ 6. IN	E: -40°C to 85°C	I: SC-70	Y: 6	Z: Lead free

**AME4620**
**■ Absolute Maximum Ratings**

Parameter	Maximum	Unit
V+ , IN	6	V
COM , NC , NO	Note 1	V
Continuous Current COM , NC , NO	300	mA
ESD Classification	B*	

Note1: Signals on COM, NC and NO can not exceed V+

Caution: Stress above the listed absolute maximum rating may cause permanent damage to the device.

\* HBM B:2000V~3999V

**■ Recommended Operating Conditions**

Parameter	Symbol	Rating	Unit
Ambient Temperature Range	T <sub>A</sub>	- 40 to 85	°C
Junction Temperature Range	T <sub>J</sub>	- 40 to 125	°C
Storage temperature Range	T <sub>STG</sub>	- 65 to 150	°C
IN	CMOS, TTL Logic		V
V+	1.8 to 5.5		V

**■ Thermal Information**

Parameter	Package	Die Attach	Symbol	Maximum	Unit
Thermal Resistance * (Junction to Case)	SC-70-6	Conductive Epoxy	$\theta_{JC}$	224	°C / W
Thermal Resistance (Junction to Ambient)			$\theta_{JA}$	331	
Internal Power Dissipation			P <sub>D</sub>	300	mW
Maximum Junction Temperature				150	°C
Solder Iron ( 10sec )**				350	°C

\* Measure  $\theta_{JC}$  on center of molding compound if IC has no tab.

\*\* MIL-STD-202G 210F

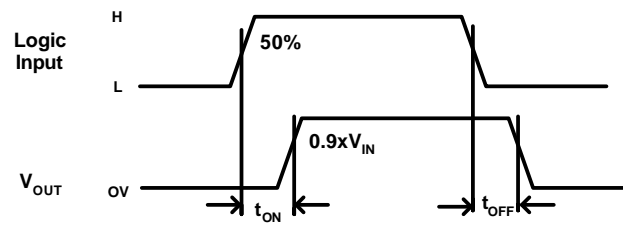
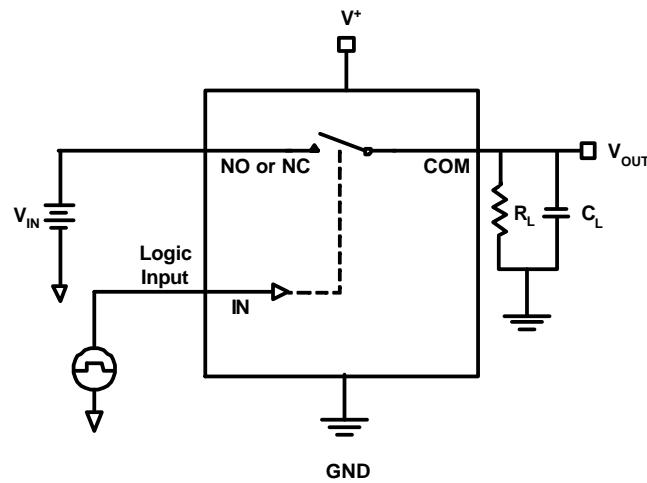
**■ Electrical Specifications**

$V^+ = +5V \pm 10\%$ ,  $GND = 0V$ ,  $IN_H = 2.4V$ ,  $IN_L = 0.8V$ ,  $T_A = -40^\circ C$  to  $85^\circ C$ , unless otherwise noted.  
Typical values are at  $T_A = 25^\circ C$ .

Parameter	Symbol	Test Condition	Min	Typ	Max	Units	
<b>ANALOG SWITCH</b>							
On-Resistance	$R_{ON}$	$V^+ = 4.5V$ $I_{COM} = 100mA$	$T_A = 25^\circ C$		1.0	$\Omega$	
			$T_A = -40^\circ C$ to $85^\circ C$		1.2		
On-Resistance Match between channels	$\Delta R_{on}$	$V^+ = 4.5V$ $I_{COM} = 100mA$ $V_{NO}$ or $V_{NC} = 3.5V$	$T_A = 25^\circ C$		0.12	$\Omega$	
			$T_A = -40^\circ C$ to $85^\circ C$		0.15		
On-Resistance Match Flatness	$R_{FLATE}$	$V^+ = 4.5V$ $I_{COM} = 100mA$ $V_{NO}$ or $V_{NC} = 0V, 1V, 2V$	$T_A = 25^\circ C$	0.15	0.2	$\Omega$	
			$T_A = -40^\circ C$ to $85^\circ C$		0.2		
Switch Off-Leakage Current	$I_{NO(OFF)}$ $I_{INC(OFF)}$	$V^+ = 5.5V$ $V_{COM} = 1V, 4.5V$ $V_{NC}$ or $V_{NO} = 4.5V$ or $1V$	$T_A = 25^\circ C$	-0.1	0.05	0.1	$\mu A$
			$T_A = -40^\circ C$ to $85^\circ C$	-1.0		1.0	
<b>DIGITAL I/O</b>							
Input Logic High	$IN_H$	$V^+ = 5.5V$	2.4			V	
Input Logic Low	$IN_L$				0.8		
Input Current Logic High or Low	$I_{IH}, I_{IL}$	$V_{IN} = V^+, 0V$	-1.0		1.0	$\mu A$	
<b>SWITCH DYNAMIC CHARACTERISTICS</b>							
Turn-On Time	$t_{ON}$	Figure 2	$T_A = 25^\circ C$		50	ns	
			$T_A = -40^\circ C$ to $85^\circ C$		60		
Turn-Off Time	$t_{OFF}$	Figure 2	$T_A = 25^\circ C$		50	ns	
			$T_A = -40^\circ C$ to $85^\circ C$		60		
Break-Before-Make Delay	$t_{BBM}$	Figure 2	$T_A = 25^\circ C$	1	20	ns	
			$T_A = -40^\circ C$ to $85^\circ C$	1			
Off-Isolation	OIRR	$R_L = 50\Omega, C_L = 5pF, f = 1MHz$ , Figure 3		-30		dB	
Crosstalk		$R_L = 50\Omega, C_L = 5pF, f = 1MHz$ , Figure 4		-30			
NC or NO Off-Capacitance	$C_{OFF}$	$f = 1MHz$ , Figure 5		38		pF	
COM ON-Capacitance	$C_{COM(ON)}$	$f = 1MHz$ , Figure 6		138			
-3dB Bandwidth	BW	$R_L = 50\Omega$ , Figure 7		400		MHz	
<b>POWER SUPPLY</b>							
Power Supply Range	$V^+$		$T_A = -40^\circ C$ to $85^\circ C$	1.8	5.5	V	
$V^+$ Supply Current	$I^+$	$V^+ = 5.5V, IN = 0V$ or $V^+$	$T_A = -40^\circ C$ to $85^\circ C$		10	$\mu A$	

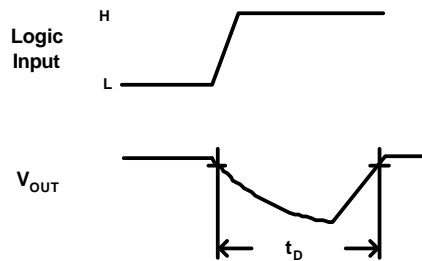
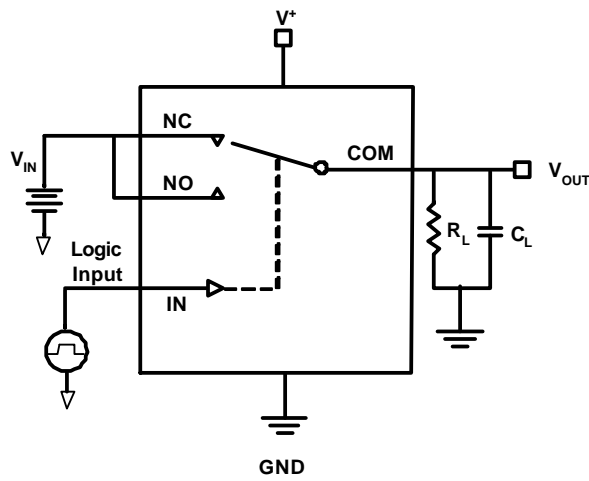
■ Timing Diagrams

Figure 1  
Switching Time



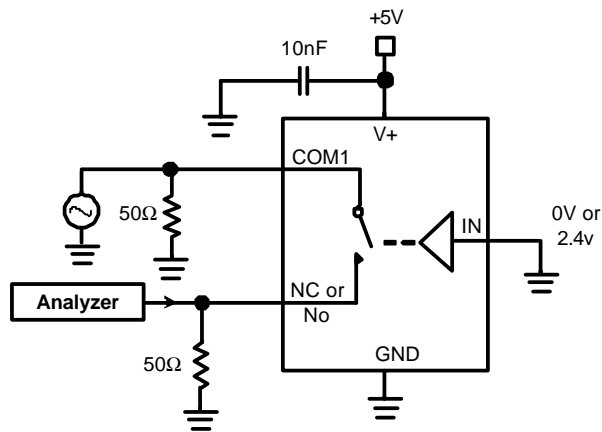
■ Timing Diagrams

Figure 2  
Break-Before-Make Interval

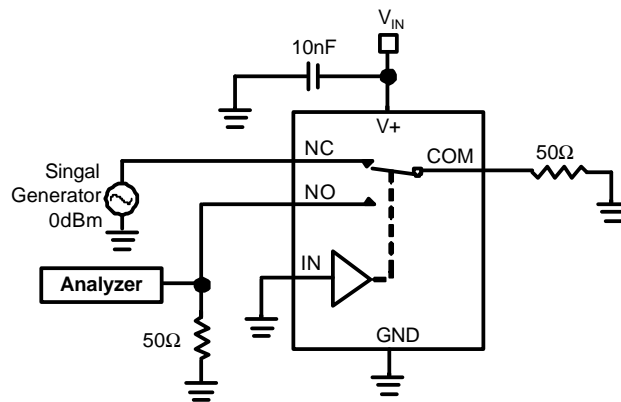


■ Test Circuit

**Figure 3**  
Off-Isolation / On Channel



**Figure 4**  
Crosstalk





■ Test Circuit

Figure 5  
NC or NO Capacitance

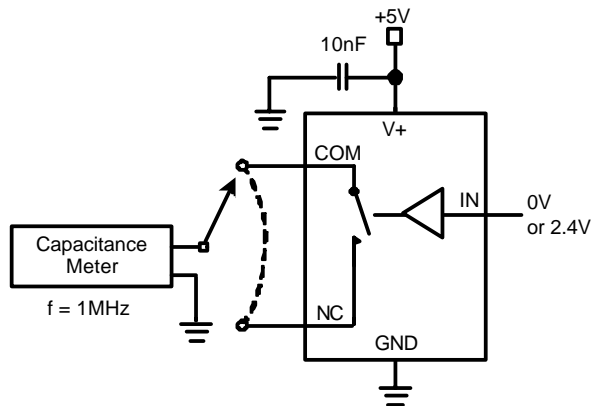
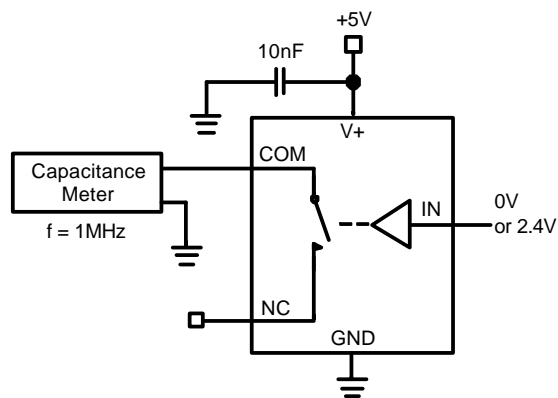
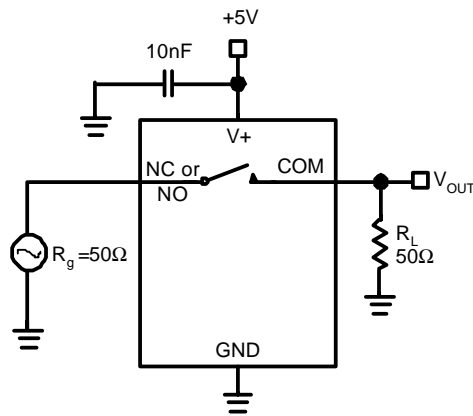


Figure 6  
COM ON Capacitance



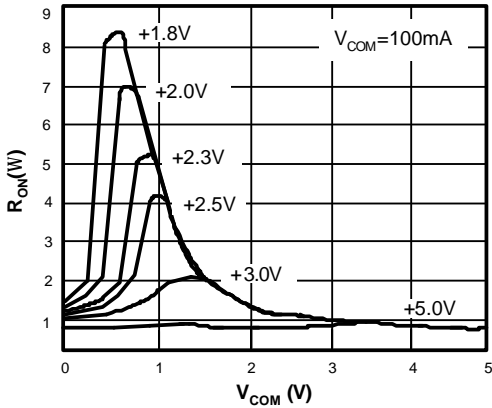
■ Test Circuit

Figure 7  
Bandwidth

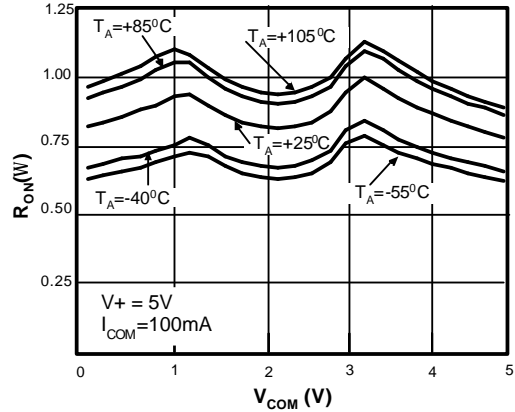




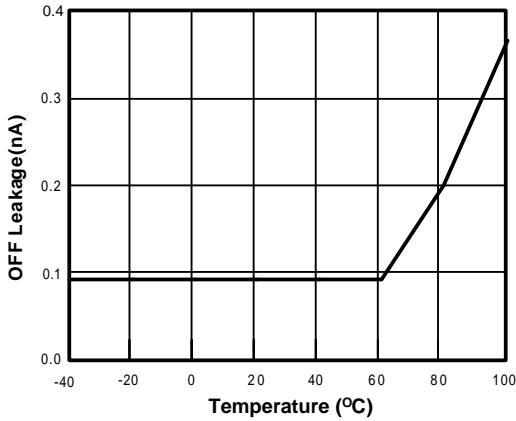
R<sub>on</sub> vs. COM Voltage over Supply Voltage



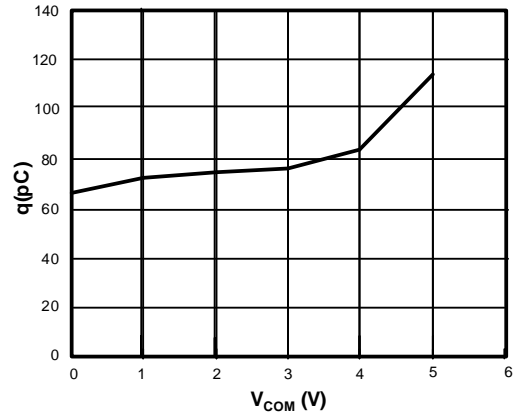
R<sub>on</sub> vs. COM Voltage over Temperature



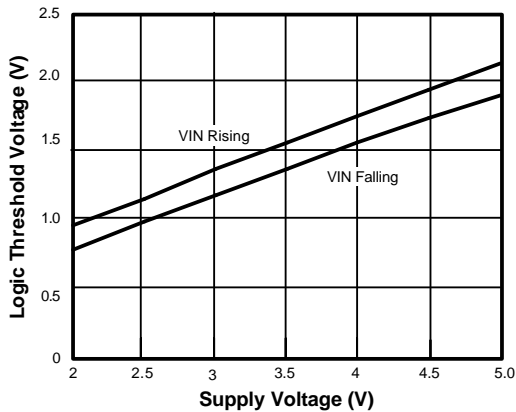
OFF Leakage vs. Temperature



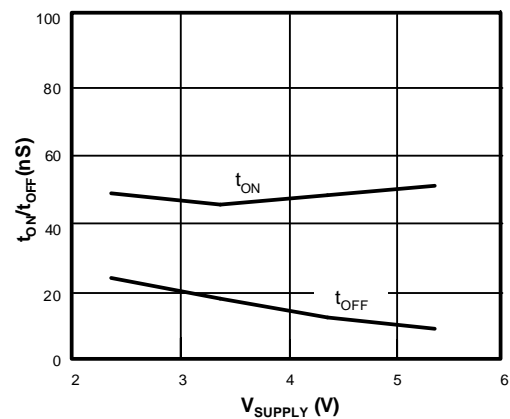
Charge Injection vs. COM Voltage



Logic Threshold Voltage vs. Supply Voltage



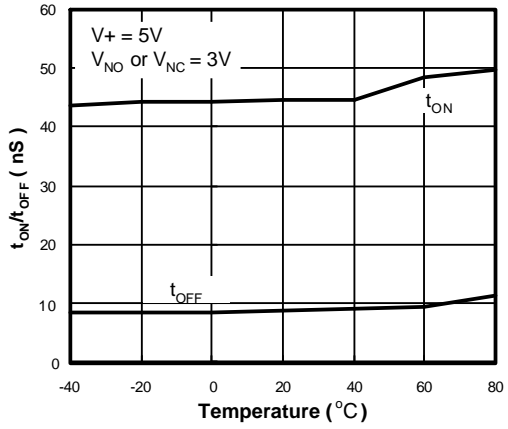
TURN-ON/OFF Times vs. Supply Voltage





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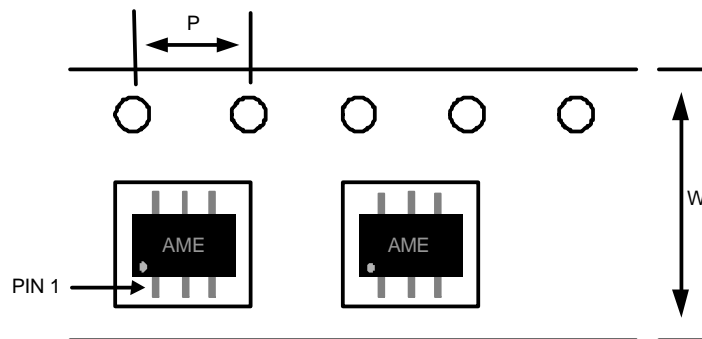
TURN-ON/OFF Times vs. Temperature



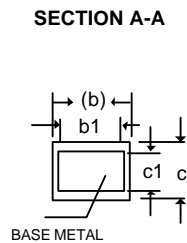
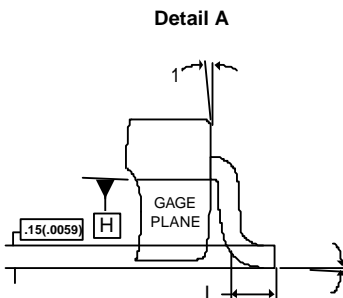
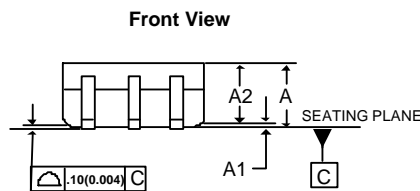
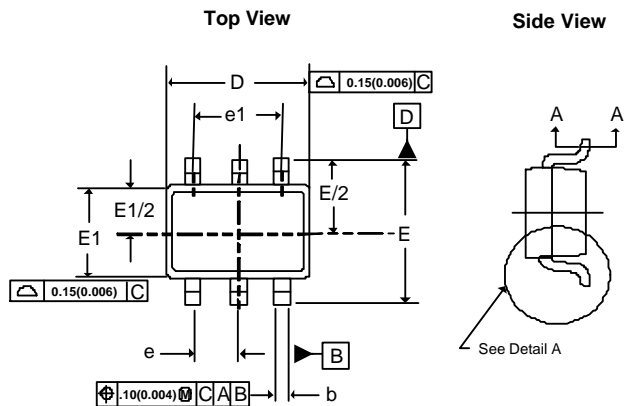
**■ Date Code Rule**
**For SC-70 Package Only**

Marking			Date Code	Year
A	A	A	W	xxx0
A	A	A	<u>W</u>	xxx1
A	A	<u>A</u>	W	xxx2
A	A	<u>A</u>	<u>W</u>	xxx3
A	<u>A</u>	A	W	xxx4
A	<u>A</u>	A	<u>W</u>	xxx5
A	<u>A</u>	<u>A</u>	W	xxx6
A	<u>A</u>	<u>A</u>	<u>W</u>	xxx7
<u>A</u>	A	A	W	xxx8
<u>A</u>	A	A	<u>W</u>	xxx9

w: Work Week Code		
A: 01&02	K: 21&22	U: 41&42
B: 03&04	L: 23&24	V: 43&44
C: 05&06	M: 25&26	W: 45&46
D: 07&08	N: 27&28	X: 47&48
E: 09&10	O: 29&30	Y: 49&50
F: 11&12	P: 31&32	Z: 51&52
G: 13&14	Q: 33&34	
H: 15&16	R: 35&36	
I: 17&18	S: 37&38	
J: 19&20	T: 39&40	

**■ Tape and Reel Dimension**
**SC-70-6**

**Carrier Tape, Number of Components Per Reel and Reel Size**

Package	Carrier Width (W)	Pitch (P)	Part Per Full Reel	Reel Size
SC-70-6	8.0±0.1 mm	4.0±0.1 mm	3000pcs	180±1 mm

**AME4620**
**■ Package Dimension**
**SC-70-6**


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
<b>A</b>	0.80	1.10	0.031	0.043
<b>A1</b>	0.00	0.10	0.000	0.004
<b>A2</b>	0.80	1.00	0.031	0.039
<b>b</b>	0.15	0.35	0.006	0.014
<b>b1</b>	0.15	0.25	0.006	0.010
<b>c</b>	0.08	0.25	0.003	0.010
<b>c1</b>	0.08	0.20	0.003	0.008
<b>D</b>	1.90	2.20	0.075	0.087
<b>E</b>	2.00	2.45	0.079	0.096
<b>E1</b>	1.15	1.35	0.045	0.053
<b>e</b>	0.65BSC		0.0255BSC	
<b>e1</b>	1.30BSC		0.0512BSC	
<b>L</b>	0.26	0.46	0.010	0.018
<b>q1</b>	0°	8°	0°	8°
<b>q2</b>	4°	10°	4°	10°



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AME, Inc. reserves the right to make changes in the circuitry and specifications of its devices and advises its customers to obtain the latest version of relevant information.

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