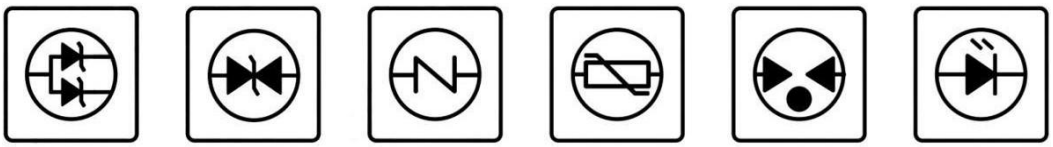
MSKSEMI 美森科
SEMICONDUCTOR



MSPE4259-63

Product specification

Description

The MSPE4259-63 is a CMOS SOI single pole dual throw (SPDT) high power switch in a low cost miniature SC70-6 package. The MSPE4259-63 is ideally suited for applications where high power, low insertion loss, and small size are required. Typical applications are for handset systems that connect separate transmit and receive functions to a common antenna, as well as other related handset and general purpose applications. This part can be used in all systems operating up to 3 GHz requiring high power at low control voltage.

Features

- $IP_{0.1dB}$: 1.6W (+32dBm) @ 3.3V, 1.4W (+31.5dBm) @1.8V
- Low insertion loss (0.28dB @ 2.5GHz)
- High isolation (24dB @ 2.5GHz)
- Low DC current: 12uA @ 3.3V, 5uA @ 1.8V
- SOT-363 Package (MSL1, 260°C per JEDEC-J-STD-020)
- ESD: 1.5 kV HBM on all pins

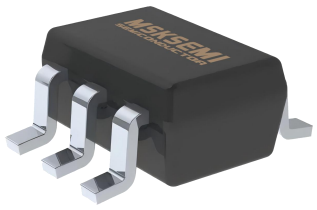
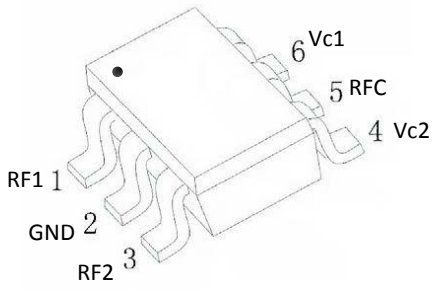
Applications

- WLAN 802.11a/b/g/n/ac/ax networks
- ISM band radios
- Low power T/R systems

ORDER INFORMATION

ORDERING NUMBER	PACKAGE	PACKING OPTION
MSPE4259-63	SC70-6	3000PCS

Connection Diagrams and Pin Description

SC70-6	PIN DESCRIPTION	MARKING
		

Copyright© Msksemi Incorporated

Table 1.Pin Definition

Pin #	Name	Description	Pin #	Name	Description
1	RF1	RF port 1	4	Vc2	Logic control 2
2	GND	Ground	5	RFC	Common Port
3	RF2	RF port 2	6	Vc1	Logic control 1

Table 2. Absolute Maximum Ratings

Parameter	Absolute Maximum
Max Input Power (0.01 - 3 GHz, 3.3 V control)	+32.5 dBm
Operating Voltage	+4.2 V
Thermal resistance (Θ_{JC})	25 ℃/W
Operating Temperature	-40℃to +85℃
Storage Temperature	-65℃to +150℃

Table 3. Recommended Operating Conditions

Parameter	Symbol	Minimum	Typical	Maximum	Units
Operating frequency	f_0	0.01		3.0	GHz
Control voltage: Low High	 Vc_L Vc_H	 0 1.6	 0 3.3	 0.4 3.6	 V V
Operating temperature	$T_{oper.}$		25		℃

Copyright© Msksemi Incorporated

Truth Table and Pin Out

Table 4. MSPE4259-63 Truth Table

Vc1	Vc2	RFC—RF1	RFC—RF2
1	0	Isolation	Insertion loss
0	1	Insertion loss	Isolation

Note: "1" = 1.6V to 3.6V. "0" = 0V to 0.4V.

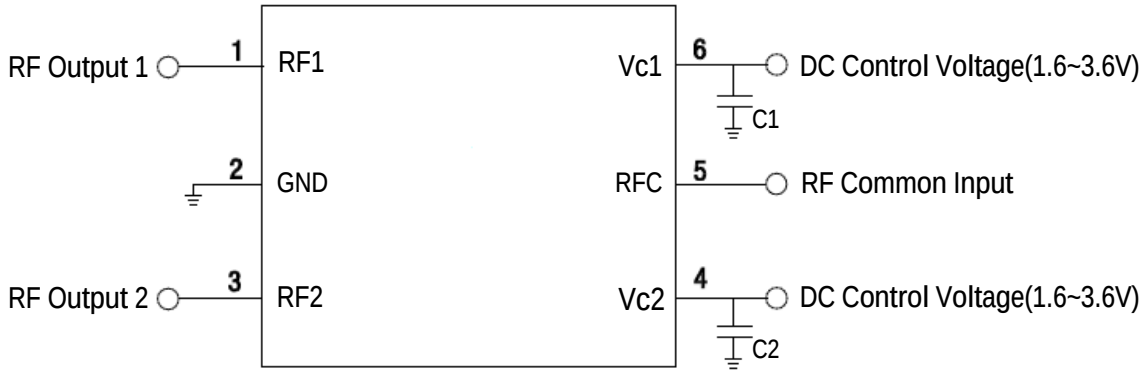


Figure2. MSPE4259-63 **PinOut**

C1 and C2 are optional bypass capacitors (100pF).The RF path should use DC block capacitor if it's with any dc voltage.

ElectricalSpecification

Table5. MSPE4259-63 **Selectricalspecificationsat25℃ (0 , +3.3V)**

Parameter	Test Condition	Min.	Typ.	Max.	Units
Insertion Loss	0.01GHz — 0.5GHz		0.20	0.30	dB
	0.5GHz — 1.5GHz		0.25	0.35	dB
	1.5GHz — 2.7GHz		0.28	0.38	dB
	2.7GHz — 3.0GHz		0.30	0.40	dB
Isolation	0.01GHz — 0.5GHz	35	40		dB
	0.5GHz — 1.5GHz	25	30		dB
	1.5GHz — 2.7GHz	22	24		dB
	2.7GHz — 3.0GHz	20	22		dB

Copyright© Msksemi Incorporated

Return Loss	0.01GHz — 0.5GHz 0.5GHz — 1.5GHz 1.5GHz — 2.7GHz 2.7GHz — 3.0GHz	25 20 20 20	30 25 25 25		dB dB dB dB
2nd Hamonic	2.45GHz, Pin=+20dBm. Vc = 0V/3.3V 2.45GHz, Pin=+25dBm. Vc = 0V/3.3V		-48 -40		dBm dBm
3rd Hamonic	2.45GHz, Pin=+20dBm. Vc = 0V/3.3V 2.45GHz, Pin=+25dBm. Vc = 0V/3.3V		-67 -47		dBm dBm
$IP_{0.1dB}$	0.01 – 3 GHz, Vc = 0V/3.3V		1.6		W
			32		dBm
	0.01 – 3 GHz, Vc = 0V/1.8V		1.4		W
			31.5		dBm
IP_{1dB}	0.01 – 3 GHz, Vc = 0V/3.3V		1.8		W
			32.5		dBm
	0.01 – 3 GHz, Vc = 0V/1.8V		1.6		W
			32		dBm
Control Current	V_{low} = 0 to 0.2 V V_{high} = 3.3 V		12	20	uA
	V_{low} = 0 to 0.2 V V_{high} = 1.8 V		5	10	uA
Trise, Tfall	10% to 90% RF, 90% to 10% RF		30		ns
	50% control to 90% RF, and 50% control to 10% RF		125		ns

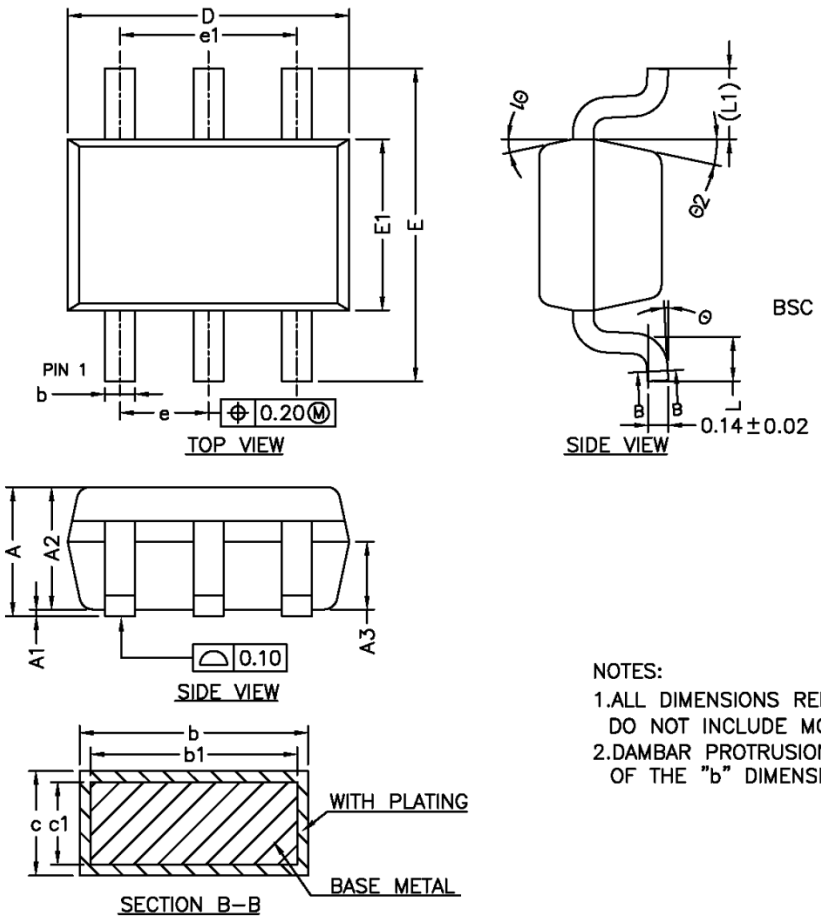
Note

1: Performance is guaranteed only under the conditions listed in this Table.

2: Board loss de-embedded.

Copyright© Msksemi Incorporated

PackageDimensions

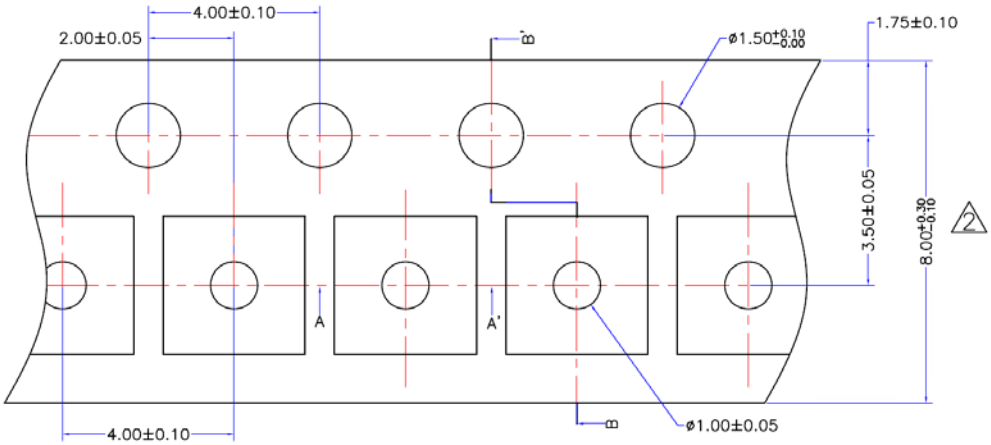


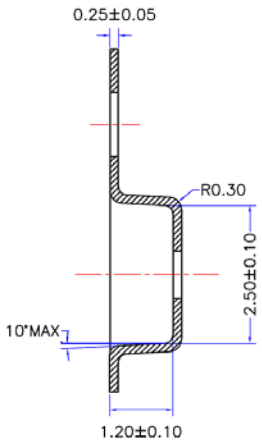
COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.80	–	1.10
A1	0	–	0.15
A2	0.80	0.90	1.00
A3	0.40	0.50	0.60
b	0.17	–	0.30
b1	0.17	0.22	0.25
c	0.14	–	0.20
c1	0.14	0.15	0.16
D	2.02	2.07	2.12
E	2.20	2.30	2.40
E1	1.21	1.26	1.31
e	0.60	0.65	0.70
e1	1.20	1.30	1.40
L	0.26	0.33	0.46
L1		0.52REF	
θ	0°	–	8°
θ1	10°	12°	14°
θ2	10°	12°	14°

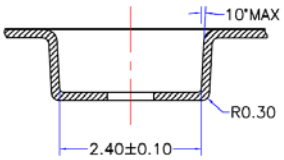
NOTES:
1.ALL DIMENSIONS REFER TO JEDEC STANDARD MO–203 AB
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.
2.DAMBAR PROTRUSION SHALL BE 0.08mm TOTAL IN EXCESS
OF THE "b" DIMENSION AT MAXIMUM MATERIAL CONDITION.

Copyright© Msksemi Incorporated



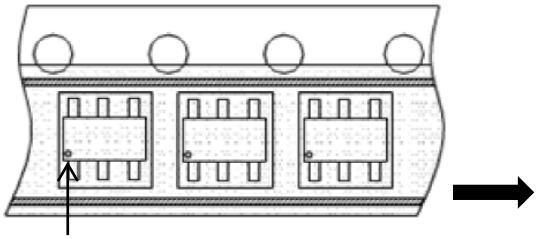


Section B–B'

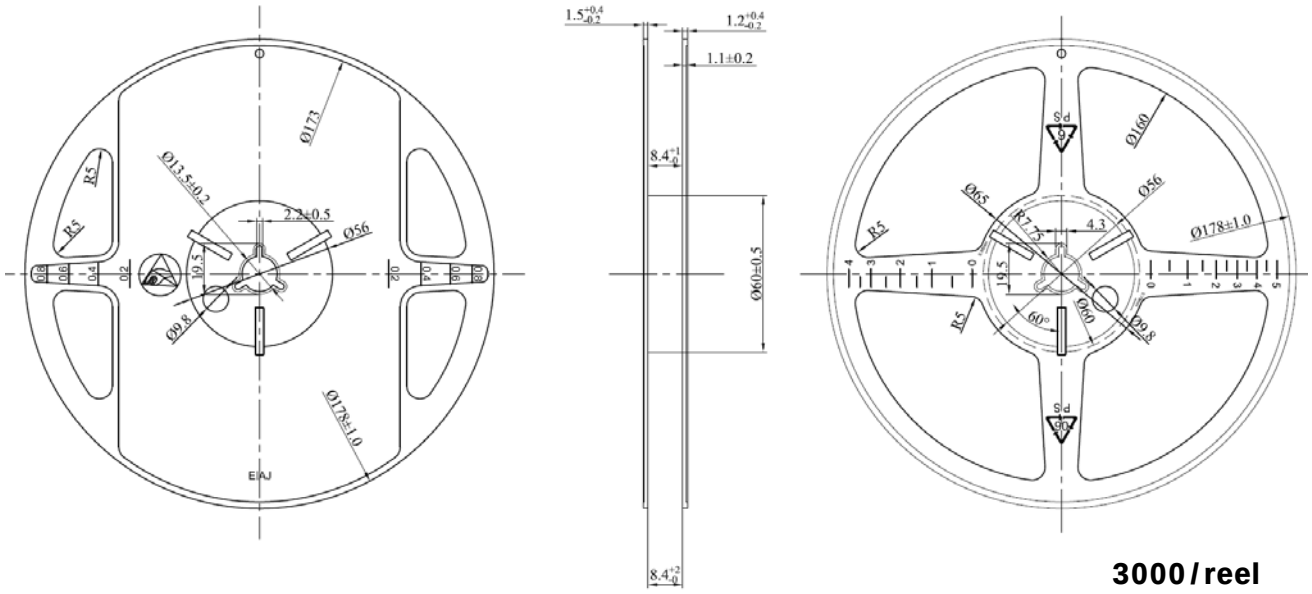


Section A–A'

NOTES:
1. ALL DIMS IN MM
2. MATERIAL: BLACK CONDUCTIVE POLYSTYRENE
3. 10 sprocket hole pitch cumulative tolerance ±0.20mm
4. Carrier camber is within 1mm in 250mm
5. There must not be foreign body adhesion and the state of the surface must be excellent
6. Surface resistance 1X10E5≤Rs≤1X10E9 OHMS
7. 17" PLASTIC–Reel, 255000 pockets (1020m)
SC70



Pin1 User Direction of Feed

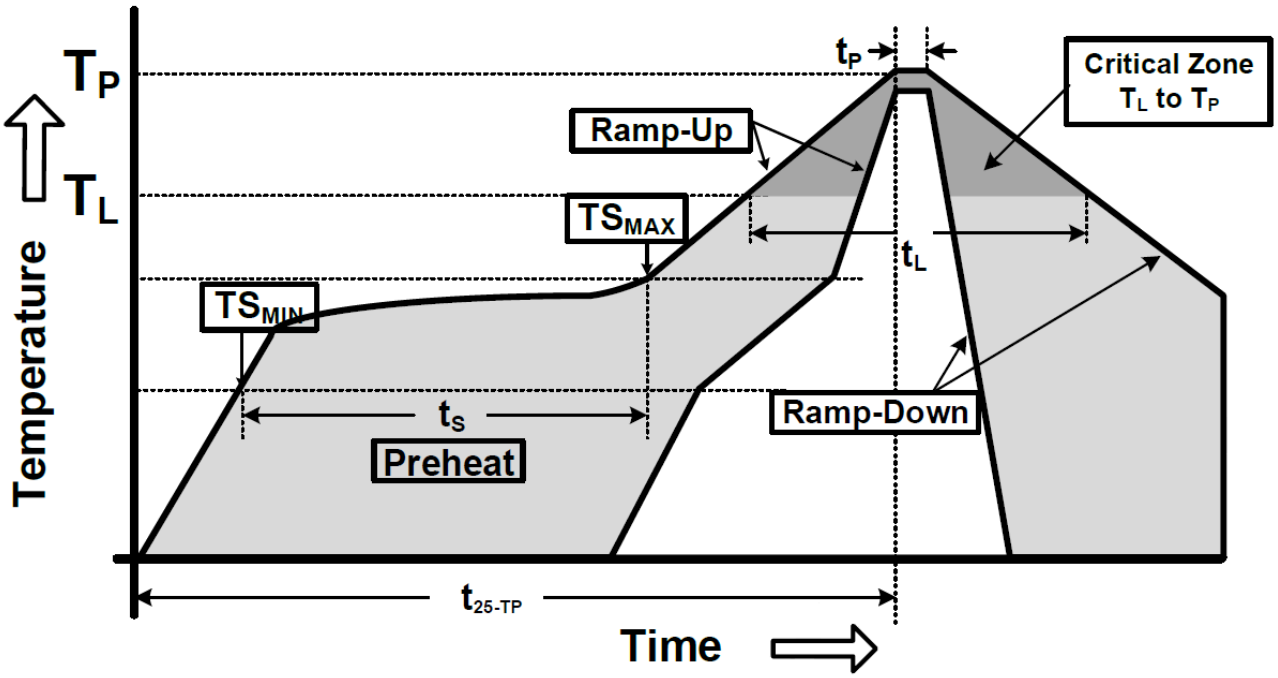


3000/reel

MSPE4259-63 TapeandReelDimensions

Copyright© Msksemi Incorporated

ReflowChart



Reflow Profile	Parameter
Preheat Temperature (TS_{MIN} to TS_{MAX})	150℃to 200℃
Preheat Time (t_S)	60 to 180 Seconds
Ramp-Up Rate (TS_{MAX} to T_P)	3℃/s MAX
Time Above T_L 217℃ (t_L)	60 to 150 Seconds
Peak Temperature (T_P)	260℃
Time within 5℃of Peak Temperature (t_P)	20 to 40 Seconds
Ramp-Down Rate (TS_{MAX} to T_P)	6℃/s MAX
Time for 25℃to Peak Temperature ($t_{25\text{-}TP}$)	8 Minutes MAX

Copyright© Msksemi Incorporated

ESDPrecautions

The MSPE4259-63 is a static-sensitive electronic device. Do not operate or store near strong electrostatic fields. ESD protection circuitry is contended in this device, but special handling precautions are required.

Human Body Model (HBM), Class-1C	HBM	1500 V
Charged Device Model (CDM), Class_C3	CDM	2000V

RoHSCompliant

The product does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE), and are therefore considered RoHS compliant.

Copyright© Msksemi Incorporated

Attention

■ Any and all MSKSEMI Semiconductor products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your MSKSEMI Semiconductor representative nearest you before using any MSKSEMI Semiconductor products described or contained herein in such applications.

■ MSKSEMI Semiconductor assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specificationsof any andall MSKSEMI Semiconductor products described orcontained herein.

■ Specifications of any and all MSKSEMI Semiconductor products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer'sproducts orequipment.

■ MSKSEMI Semiconductor. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with someprobability. It is possiblethat these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits anderror prevention circuitsfor safedesign, redundant design, and structural design.

■ In the event that any or all MSKSEMI Semiconductor products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from theauthorities concerned in accordance with the above law.

■ No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of MSKSEMI Semiconductor.

■ Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. MSKSEMI Semiconductor believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringementsof intellectual property rights or other rightsof third parties.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. Whendesigning equipment, referto the "Delivery Specification" for the MSKSEMI Semiconductor productthat you intend to use.

Copyright© Msksemi Incorporated