To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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RENESAS

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DATA SHEET

RENESAS

SILICON POWER MOS FET

NE5510279A

4.8 V OPERATION SILICON RF POWER LDMOS FET FOR 1.8 GHz 2 W TRANSMISSION AMPLIFIERS

DESCRIPTION

The NE5510279A is an N-channel silicon power MOS FET specially designed as the transmission power amplifier for 4.8 V GSM 1 800 handsets. Dies are manufactured using our NEWMOS technology (our 0.6 μm WSi gate laterally diffused MOS FET) and housed in a surface mount package. The device can deliver 33.0 dBm output power with 47% power added efficiency at 1.8 GHz under the 4.8 V supply voltage.

FEATURES

- High output power : P_{out} = 35.5 dBm TYP. (V_{DS} = 4.8 V, I_{Dset} = 300 mA, f = 900 MHz, P_{in} = 25 dBm)
  : P_{out} = 33.0 dBm TYP. (V_{DS} = 4.8 V, I_{Dset} = 300 mA, f = 1.8 GHz, P_{in} = 25 dBm)
- High power added efficiency : η_{add} = 65% TYP. (V_{DS} = 4.8 V, I_{Dset} = 300 mA, f = 900 MHz, P_{in} = 25 dBm)
  : η_{add} = 47% TYP. (V_{DS} = 4.8 V, I_{Dset} = 300 mA, f = 1.8 GHz, P_{in} = 25 dBm)
- High linear gain : G_L = 16.0 dB TYP. (V_{DS} = 4.8 V, I_{Dset} = 300 mA, f = 900 MHz, P_{in} = 10 dBm)
  : G_L = 10.0 dB TYP. (V_{DS} = 4.8 V, I_{Dset} = 300 mA, f = 1.8 GHz, P_{in} = 10 dBm)
- Surface mount package : 5.7 × 5.7 × 1.1 mm MAX.
- ★ Single supply : V_{DS} = 3.0 to 8.0 V

APPLICATIONS

- Digital cellular phones : 4.8 V GSM 1 800 class 1 handsets
- Others : General purpose amplifiers for 1.6 to 2.0 GHz TDMA applications

ORDERING INFORMATION

Part Number	Package	Marking	Supplying Form
NE5510279A-T1	79A	W2	• 12 mm wide embossed taping • Gate pin face the perforation side of the tape • Qty 1 kpcs/reel

Remark To order evaluation samples, contact your nearby sales office.
Part number for sample order: NE5510279A

Caution Observe precautions when handling because these devices are sensitive to electrostatic discharge.

Document No. PU10121EJ03V0DS (3rd edition)
Date Published July 2003 CP(K)
Printed in Japan

The mark ★ shows major revised points.

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V_{DS}	20.0	V
Gate to Source Voltage	V_{GS}	5.0	V
Drain Current	I_D	1.0	A
Drain Current (Pulse Test)	I_D Note	2.0	A
Total Power Dissipation	P_{tot}	20	W
Channel Temperature	T_{ch}	125	°C
Storage Temperature	T_{stg}	–65 to +125	°C

Note Duty Cycle ≤ 50%, T_{on} ≤ 1 s

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
★ Drain to Source Voltage	V_{DS}		3.0	4.8	8.0	V
Gate to Source Voltage	V_{GS}		0	2.0	3.5	V
Drain Current (Pulse Test)	I_D	Duty Cycle ≤ 50%, T_{on} ≤ 1 s	–	1.0	1.5	A
Input Power	P_{in}	f = 1.8 GHz, V_{DS} = 4.8 V	25	–	27	dBm

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

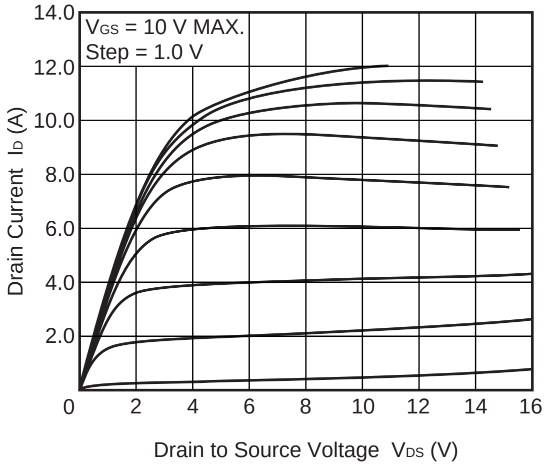
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Gate to Source Leak Current	I_{GSS}	V_{GSS} = 5.0 V	–	–	100	nA
Drain to Source Leakage Current (Zero Gate Voltage Drain Current)	I_{DSS}	V_{DSS} = 8.5 V	–	–	100	nA
Gate Threshold Voltage	V_{th}	V_{DS} = 4.8 V, I_D = 1 mA	1.0	1.35	2.0	V
Transconductance	G_m	V_{DS} = 4.8 V, I_D = 600 mA	–	1.50	–	S
Drain to Source Breakdown Voltage	BV_{DSS}	I_{DSS} = 10 μA	20	24	–	V
Thermal Resistance	R_{th}	Channel to Case	–	5	–	°C/W
Linear Gain	G_L	f = 900 MHz, P_{in} = 10 dBm, V_{DS} = 4.8 V, I_{Dset} = 300 mA, **Note 1, 2**	–	16.0	–	dB
Output Power	P_{out}	f = 900 MHz, P_{in} = 25 dBm, V_{DS} = 4.8 V, I_{Dset} = 300 mA, **Note 1, 2**	–	35.5	–	dBm
Operating Current	I_{op}		–	1 000	–	mA
Power Added Efficiency	η_{add}		–	65	–	%
Linear Gain	G_L	f = 1.8 GHz, P_{in} = 10 dBm, V_{DS} = 4.8 V, I_{Dset} = 300 mA, **Note 1, 2**	–	10.0	–	dB
Output Power	P_{out}	f = 1.8 GHz, P_{in} = 25 dBm, V_{DS} = 4.8 V, I_{Dset} = 300 mA, **Note 1, 2**	32.0	33.0	–	dBm
Operating Current	I_{op}		–	750	–	mA
Power Added Efficiency	η_{add}		38	47	–	%

Notes 1. Peak measurement at Duty Cycle ≤ 50%, T_{on} ≤ 1 s.

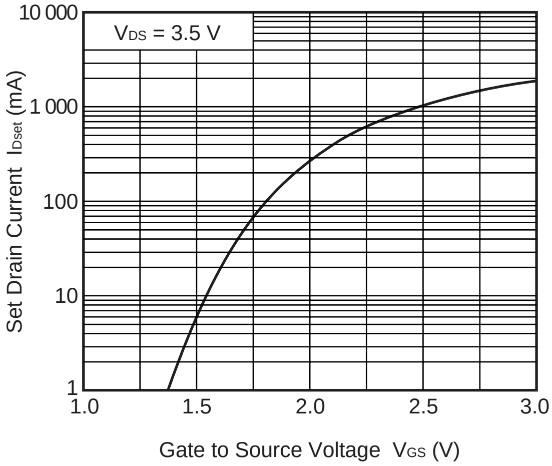
2. DC performance is 100% testing. RF performance is testing several samples per wafer. Wafer rejection criteria for standard devices is 1 reject for several samples.

TYPICAL CHARACTERISTICS (T_A = +25°C)

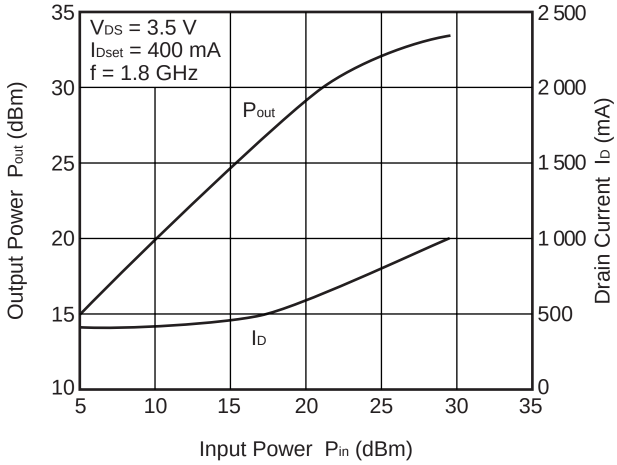
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



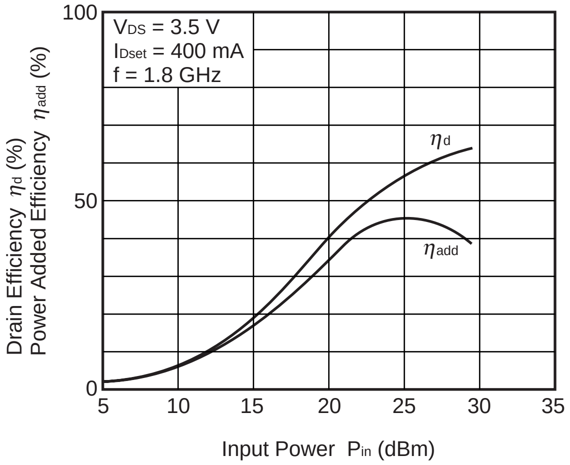
SET DRAIN CURRENT vs.
GATE TO SOURCE VOLTAGE



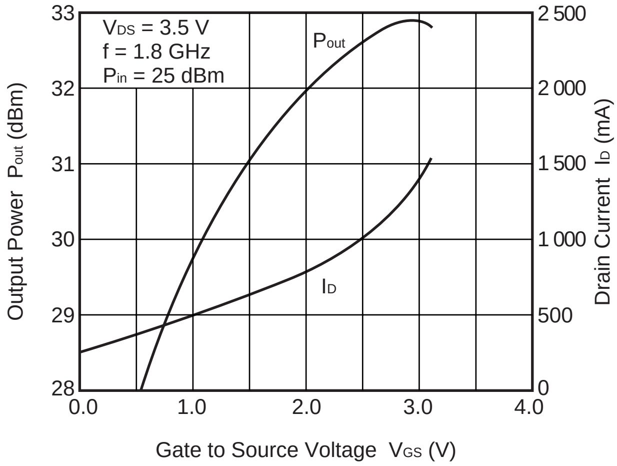
OUTPUT POWER, DRAIN CURRENT
vs. INPUT POWER



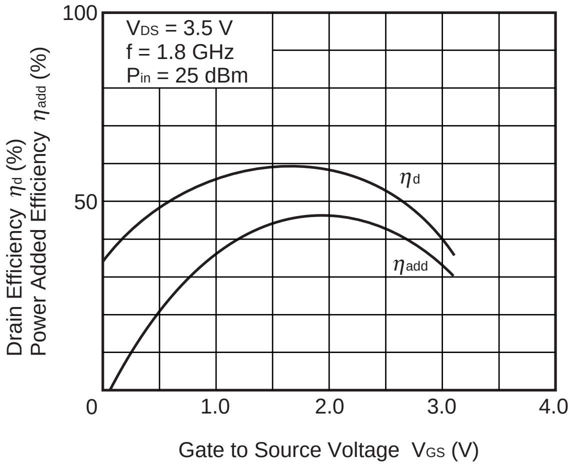
DRAIN EFFICIENCY, POWER ADDED
EFFICIENCY vs. INPUT POWER



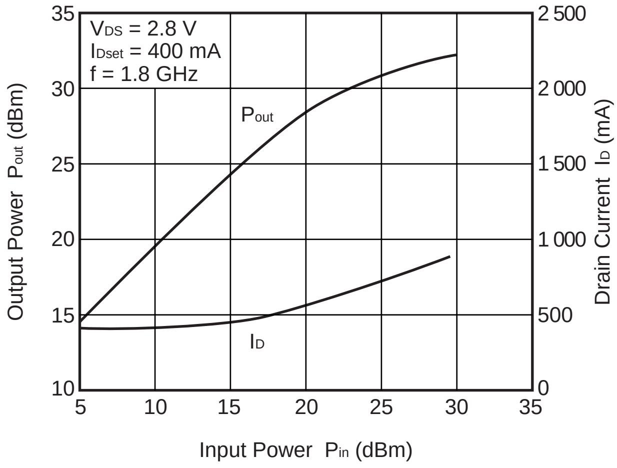
OUTPUT POWER, DRAIN CURRENT
vs. GATE TO SOURCE VOLTAGE



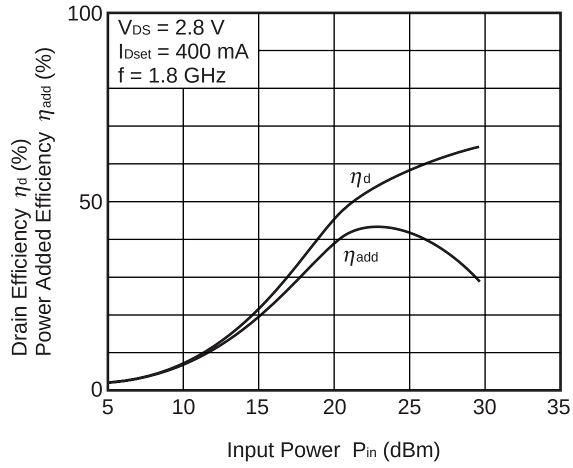
DRAIN EFFICIENCY, POWER ADDED
EFFICIENCY vs. GATE TO SOURCE VOLTAGE



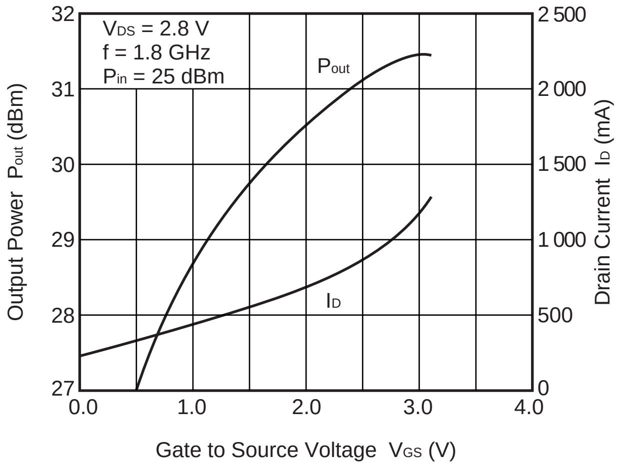
OUTPUT POWER, DRAIN CURRENT vs. INPUT POWER



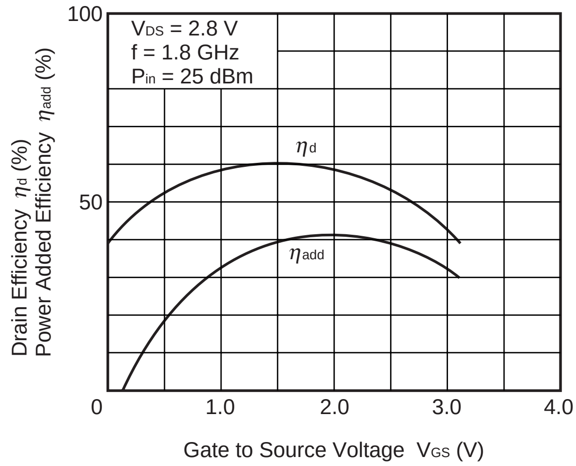
DRAIN EFFICIENCY, POWER ADDED EFFICIENCY vs. INPUT POWER



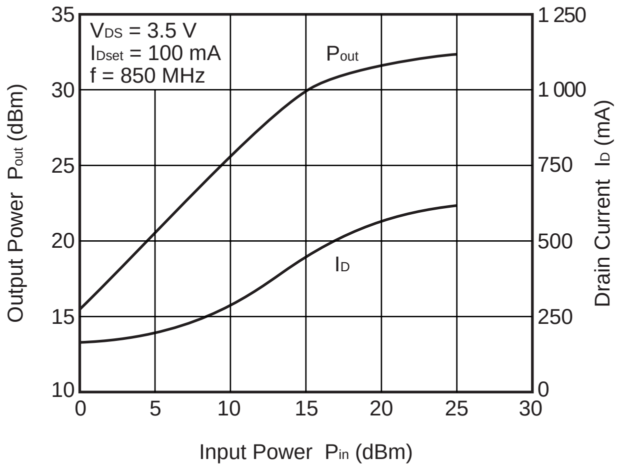
OUTPUT POWER, DRAIN CURRENT vs. GATE TO SOURCE VOLTAGE



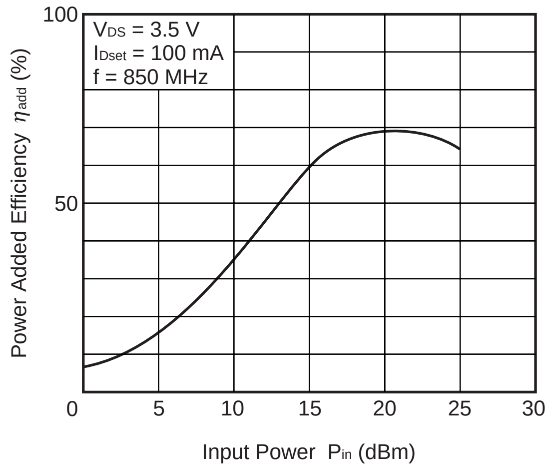
DRAIN EFFICIENCY, POWER ADDED EFFICIENCY vs. GATE TO SOURCE VOLTAGE



OUTPUT POWER, DRAIN CURRENT vs. INPUT POWER



POWER ADDED EFFICIENCY vs. INPUT POWER



Remark The graphs indicate nominal characteristics.

S-PARAMETERS

S-parameters/Noise parameters are provided on the NEC Compound Semiconductor Devices Web site in a form (S2P) that enables direct import to a microwave circuit simulator without keyboard input.

Click here to download S-parameters.

[RF and Microwave] → [Device Parameters]

URL http://www.csd-nec.com/

LARGE SIGNAL IMPEDANCE (V_{DS} = 3.5 V, I_D = 400 mA, P_{in} = 25 dBm)

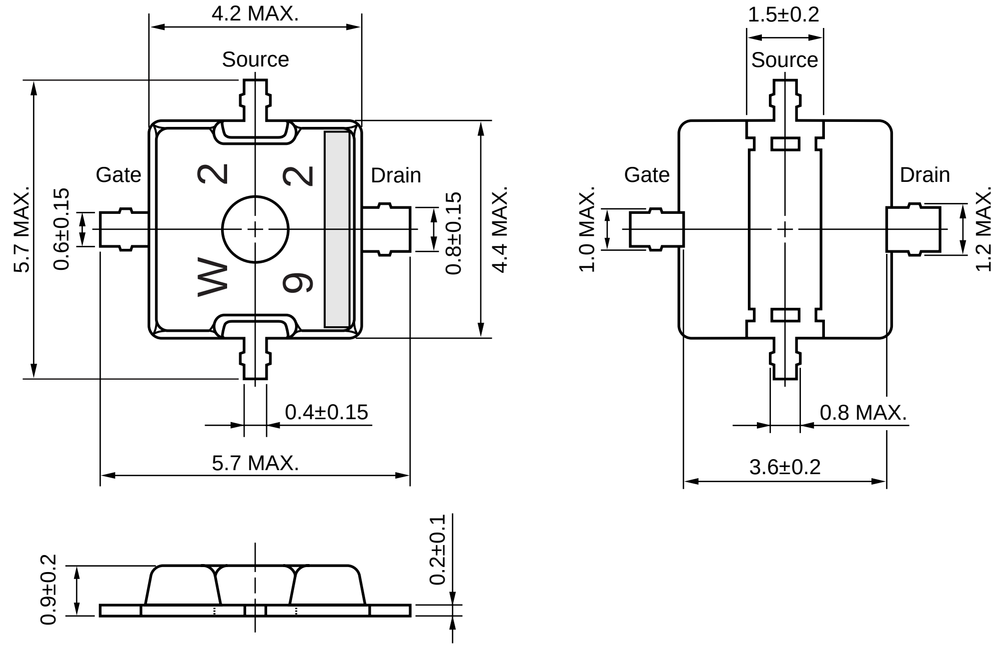
f (GHz)	Z_{in} (Ω)	Z_{OL} (Ω) Note
1.8	TBD	TBD

Note Z_{OL} is the conjugate of optimum load impedance at given voltage, idling current, input power and frequency.

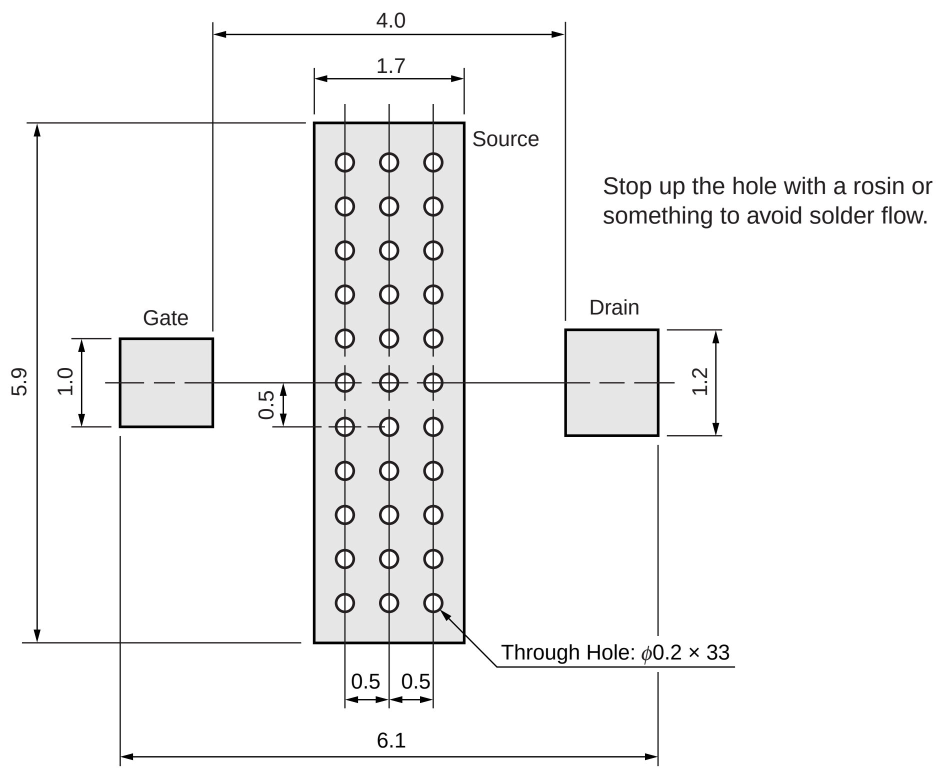
★ PACKAGE DIMENSIONS

79A (UNIT: mm)

(Bottom View)



79A PACKAGE RECOMMENDED P.C.B. LAYOUT (UNIT: mm)



RECOMMENDED SOLDERING CONDITIONS

This product should be soldered and mounted under the following recommended conditions. For soldering methods and conditions other than those recommended below, contact your nearby sales office.

Soldering Method	Soldering Conditions		Condition Symbol
Infrared Reflow	Peak temperature (package surface temperature) Time at peak temperature Time at temperature of 220°C or higher Preheating time at 120 to 180°C Maximum number of reflow processes Maximum chlorine content of rosin flux (% mass)	: 260°C or below : 10 seconds or less : 60 seconds or less : 120±30 seconds : 3 times : 0.2%(Wt.) or below	IR260
VPS	Peak temperature (package surface temperature) Time at temperature of 200°C or higher Preheating time at 120 to 150°C Maximum number of reflow processes Maximum chlorine content of rosin flux (% mass)	: 215°C or below : 25 to 40 seconds : 30 to 60 seconds : 3 times : 0.2%(Wt.) or below	VP215
Wave Soldering	Peak temperature (molten solder temperature) Time at peak temperature Preheating temperature (package surface temperature) Maximum number of flow processes Maximum chlorine content of rosin flux (% mass)	: 260°C or below : 10 seconds or less : 120°C or below : 1 time : 0.2%(Wt.) or below	WS260
Partial Heating	Peak temperature (pin temperature) Soldering time (per pin of device) Maximum chlorine content of rosin flux (% mass)	: 350°C or below : 3 seconds or less : 0.2%(Wt.) or below	HS350-P3

Caution Do not use different soldering methods together (except for partial heating).

▶**For further information, please contact**

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