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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SILICON POWER MOS FET

NE5500234

N-CHANNEL SILICON POWER MOS FET
POWER AMPLIFIER FOR DCS1800/PCS1900 HANDSETS

DESCRIPTION

The NE5500234 is an N-channel silicon power MOS FET specially designed as the transmission power amplifier for DCS1800 and PCS1900 handsets. Dies are manufactured using our NEWMOS technology (our 0.6 μm WSi gate lateral MOS FET), housed in a surface mount 3-pin power Minimold (34 PKG) (SOT-89 type) package. The device can deliver 32.5 dBm output power with 50% power added efficiency at 1.9 GHz under the 4.8 V supply voltage.

FEATURES

- High output power : P_{out} = 32.5 dBm TYP. (V_{DS} = 4.8 V, I_{Dset} = 400 mA, f = 1.9 GHz, P_{in} = 25 dBm)
- High power added efficiency : η_{add} = 50% TYP. (V_{DS} = 4.8 V, I_{Dset} = 400 mA, f = 1.9 GHz, P_{in} = 25 dBm)
- High linear gain : G_L = 11 dB TYP. (V_{DS} = 4.8 V, I_{Dset} = 400 mA, f = 1.9 GHz)
- Surface mount package : 3-pin power Minimold (34 PKG) (SOT-89 type)
- Single supply : V_{DS} = 3.0 to 6.0 V

APPLICATIONS

- Digital cellular phones : DCS1800/PCS1900 handsets
- <R> Handheld transceiver : FRS (Family Radio Service), GMRS (General Mobile Radio Service)
- Others : General purpose amplifiers for various applications

<R> ORDERING INFORMATION

Part Number	Order Number	Package	Marking	Supplying Form
NE5500234	NE5500234-AZ	3-pin power minimold (SOT-89, Our code: 34) (Pb-Free : External solder plating)	V2	• Magazine case • Qty 25 pcs/case
NE5500234-T1	NE5500234-T1-AZ	3-pin power minimold (SOT-89, Our code: 34) (Pb-Free : External solder plating)		• 12 mm wide embossed taping • Source pin face the perforation side of the tape • Qty 1 kpcs/reel

Remarks 1. To order evaluation samples, contact your nearby sales office.
Part number for sample order: NE5500234

2. This product is containing Pb-material inside.

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

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Date Published August 2007 NS
Printed in Japan

The mark <R> shows major revised points.

The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Operation in excess of any one of these parameters may result in permanent damage.

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V_{DS}	20	V
Gate to Source Voltage	V_{GS}	6.0	V
Drain Current	I_D	1.0	A
Total Power Dissipation	P_{tot}	10	W
Channel Temperature	T_{ch}	125	°C
Storage Temperature	T_{stg}	–65 to +125	°C

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Drain to Source Voltage	V_{DS}		3.0	4.8	6.0	V
Gate to Source Voltage	V_{GS}		0	2.0	3.5	V
Drain Current	I_D	Duty Cycle ≤ 50%, T_{on} ≤ 1 s	–	0.75	1.0	A
Input Power	P_{in}	f = 1.9 GHz, V_{DS} = 4.8 V	–	–	27	dBm

ELECTRICAL CHARACTERISTICS

(T_A = +25°C, unless otherwise specified, using our standard test fixture.)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Gate to Source Leakage Current	I_{GSO}	V_{GS} = 6.0 V	–	–	100	nA
Drain to Source Leakage Current (Zero Gate Voltage Drain Current)	I_{DSS}	V_{DS} = 8.5 V	–	–	100	nA
Gate Threshold Voltage	V_{th}	V_{DS} = 4.8 V, I_{DS} = 1 mA	1.0	1.4	2.0	V
Thermal Resistance	R_{th}	Channel to Case	–	10	–	°C/W
Transconductance	g_m	V_{DS} = 4.8 V, I_{DS} = 500 mA	–	840	–	mS
Drain to Source Breakdown Voltage	BV_{DSS}	I_{DSS} = 10 μA	20	24	–	V
Output Power	P_{out}	f = 1.9 GHz, V_{DS} = 4.8 V, P_{in} = 25 dBm, I_{Dset} = 400 mA (RF OFF)	31.5	32.5	–	dBm
Drain Current	I_D		–	610	–	mA
Power Added Efficiency	η_{add}		43	50	–	%
Linear Gain[Note]	G_L		–	11.0	–	dB

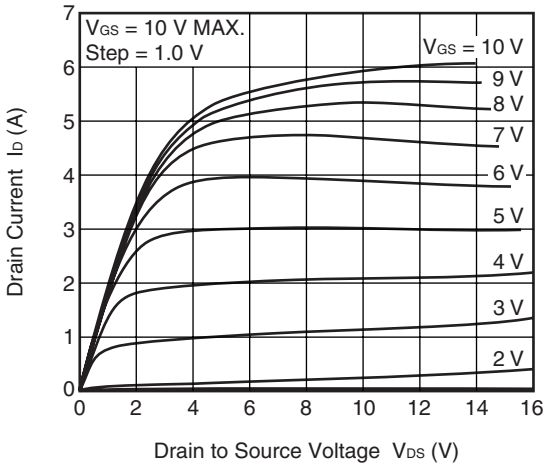
Note P_{in} = 10 dBm

DC performance is 100% testing. RF performance is testing several samples per wafer.

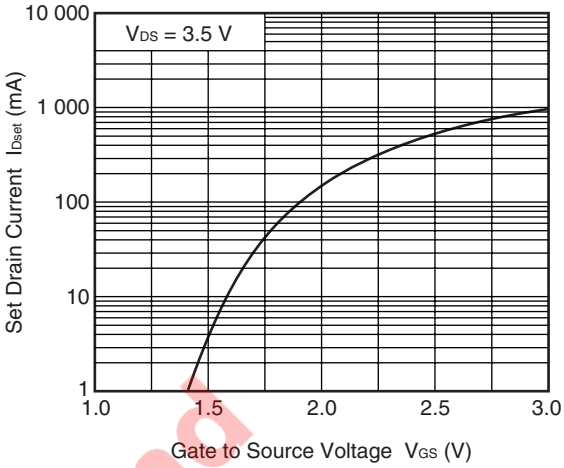
Wafer rejection criteria for standard devices is 1 reject for several samples.

<R> **TYPICAL CHARACTERISTICS (T_A = +25°C)**

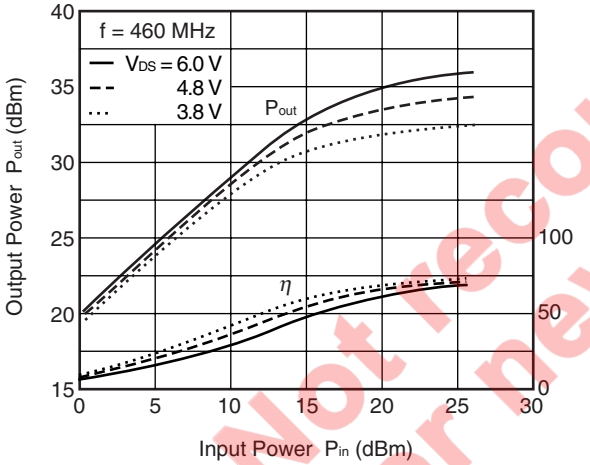
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



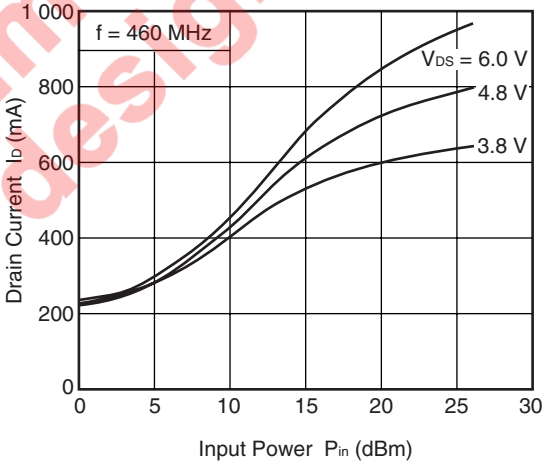
SET DRAIN CURRENT vs.
GATE TO SOURCE VOLTAGE



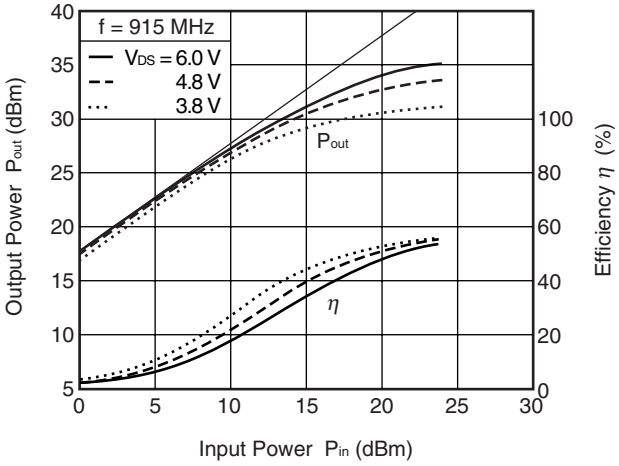
OUTPUT POWER, EFFICIENCY
vs. INPUT POWER



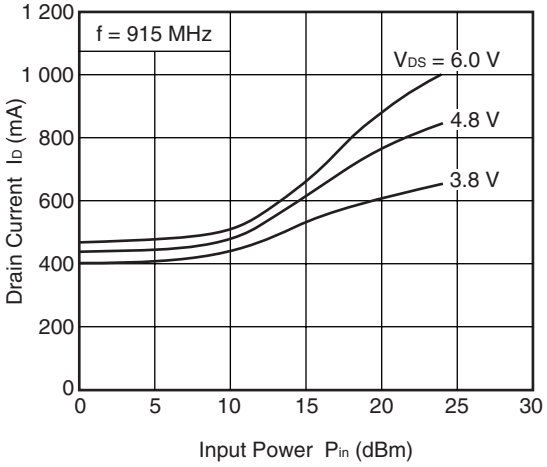
DRAIN CURRENT vs. INPUT POWER



OUTPUT POWER, EFFICIENCY
vs. INPUT POWER

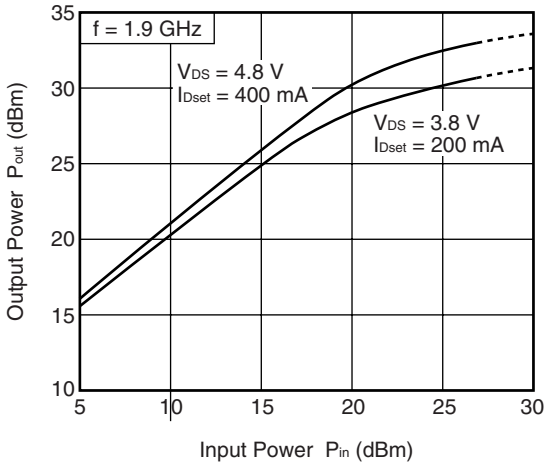


DRAIN CURRENT vs. INPUT POWER

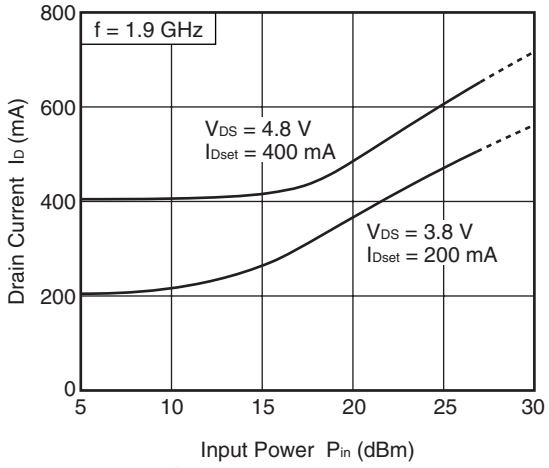


Remark The graphs indicate nominal characteristics.

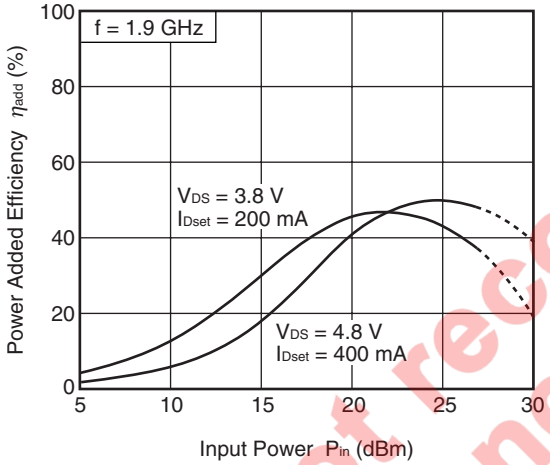
OUTPUT POWER vs. INPUT POWER



DRAIN CURRENT vs. INPUT POWER



POWER ADDED EFFICIENCY vs. INPUT POWER

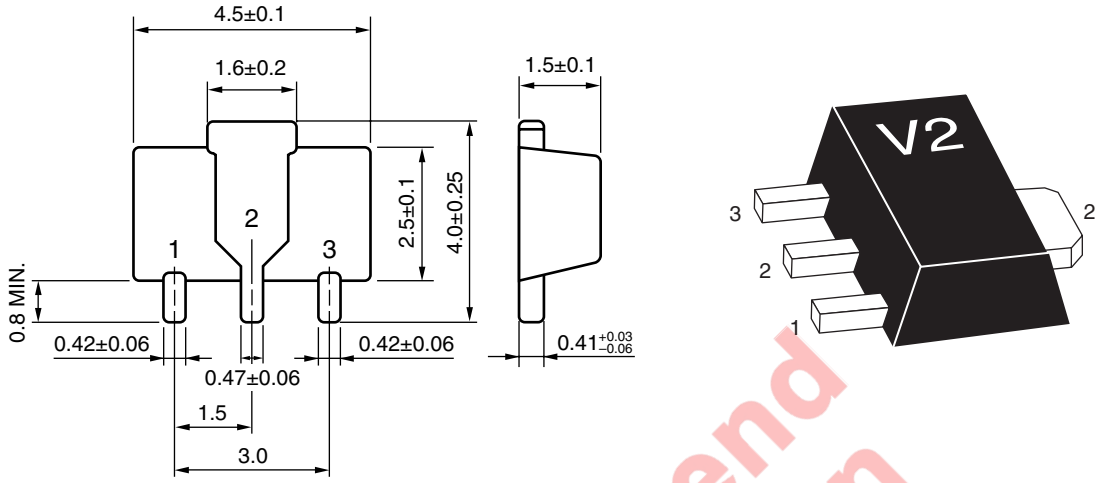


Remark The graphs indicate nominal characteristics.

PACKAGE DIMENSIONS

3-PIN POWER MINIMOLD (34 PKG) (UNIT: mm)

(Bottom View) (Side View) (Top View)



PIN CONNECTIONS

1. Drain
2. Source
3. Gate

<R> 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
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 (terminal temperature) Soldering time (per side of device) Maximum chlorine content of rosin flux (% mass)	: 350°C or below : 3 seconds or less : 0.2%(Wt.) or below	HS350

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

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