

DATA SHEET

NEC

SILICON POWER MOS FET NE5500134

N-CHANNEL SILICON POWER MOS FET POWER AMPLIFIER FOR 0.8 TO 2.0 GHz CELLULAR HANDSETS

DESCRIPTION

The NE5500134 is an N-channel silicon power MOS FET specially designed as the transmission power amplifier for 0.8 to 2.0 GHz cellular 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 29.5 dBm output power with 55% power added efficiency at 1.9 GHz under the 4.8 V supply voltage.

FEATURES

- High output power : $P_{\text{out}} = 29.5 \text{ dBm TYP.}$ ($V_{\text{DS}} = 4.8 \text{ V}$, $I_{\text{Dset}} = 200 \text{ mA}$, $f = 1.9 \text{ GHz}$, $P_{\text{in}} = 20 \text{ dBm}$)
- High power added efficiency : $\eta_{\text{add}} = 55\% \text{ TYP.}$ ($V_{\text{DS}} = 4.8 \text{ V}$, $I_{\text{Dset}} = 200 \text{ mA}$, $f = 1.9 \text{ GHz}$, $P_{\text{in}} = 20 \text{ dBm}$)
- High linear gain : $G_{\text{L}} = 13 \text{ dB TYP.}$ ($V_{\text{DS}} = 4.8 \text{ V}$, $I_{\text{Dset}} = 200 \text{ mA}$, $f = 1.9 \text{ GHz}$, $P_{\text{in}} = 10 \text{ dBm}$)
- Surface mount package : 3-pin power minimold (34 PKG) (SOT-89 type)
- Single supply : $V_{\text{DS}} = 3.0 \text{ to } 6.0 \text{ V}$

APPLICATIONS

- Digital cellular phones : Driver amplifiers for DCS1800/PCS1900 handsets
- Others : General purpose amplifiers for 0.8 to 2.0 GHz TDMA applications

<R> ORDERING INFORMATION

Part Number	Order Number	Package	Marking	Supplying Form
NE5500134	NE5500134-AZ	3-pin power minimold (SOT-89, Our code: 34) (Pb-Free : External solder plating)	V1	<ul style="list-style-type: none"> • Magazine case • Qty 25 pcs/case
NE5500134-T1	NE5500134-T1-AZ	3-pin power minimold (SOT-89, Our code: 34) (Pb-Free : External solder plating)		<ul style="list-style-type: none"> • 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: NE5500134

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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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	0.5	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	-	0.3	0.5	A
Input Power	P _{in}	f = 1.9 GHz, V _{DS} = 4.8 V	-	-	20	dBm

ELECTRICAL CHARACTERISTICS

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

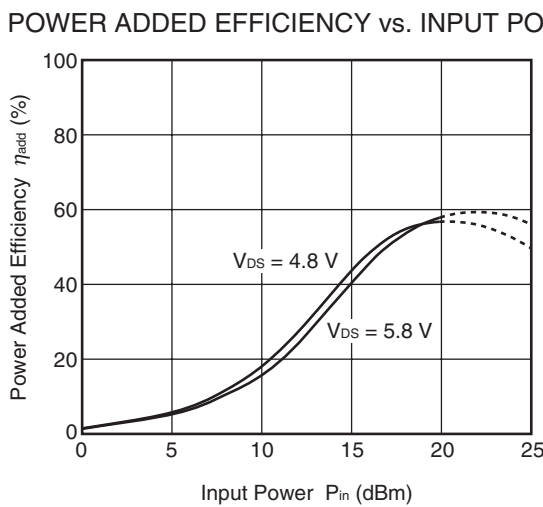
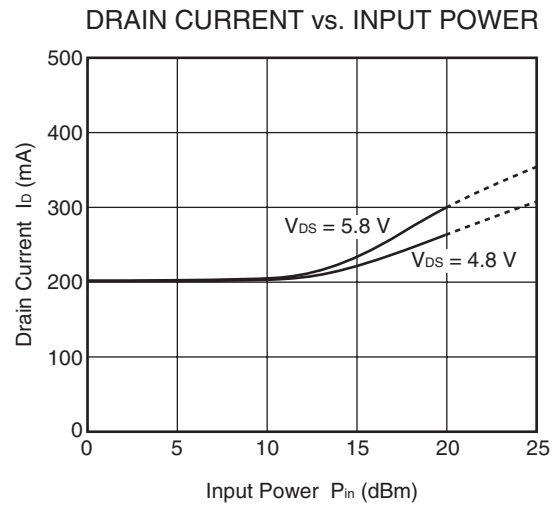
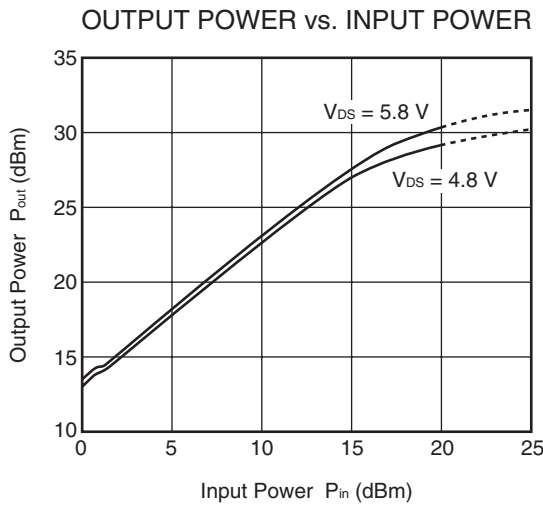
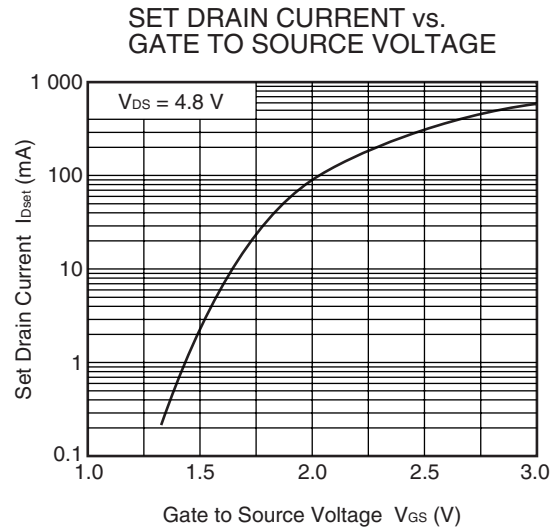
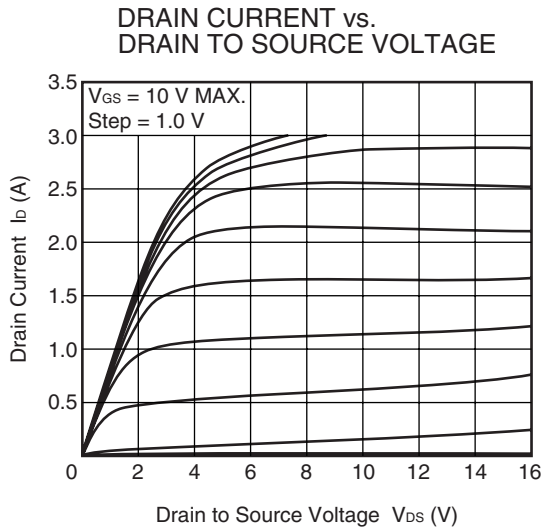
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Gate to Source Leakage Current	I _{ISO}	V _{GS} = 6.0 V	-	-	100	nA
Drain to Source Leakage Current (Zero Gate Voltage Drain Current)	I _{DSS}	V _{DS} = 8.5 V	-	-	100	nA
Gate Threshold Voltage	V _{th}	V _{DS} = 4.8 V, I _{DS} = 1 mA	1.0	1.45	2.0	V
Thermal Resistance	R _{th}	Channel to Case	-	10	-	°C/W
Transconductance	g _m	V _{DS} = 4.8 V, I _{DS} = 250 mA	-	410	-	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} = 20 dBm, I _{Dset} = 200 mA (RF OFF)	28.5	29.5	-	dBm
Drain Current	I _D		-	0.3	-	A
Power Added Efficiency	η _{add}		48	55	-	%
Linear Gain ^{Note}	G _L		-	13.0	-	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.

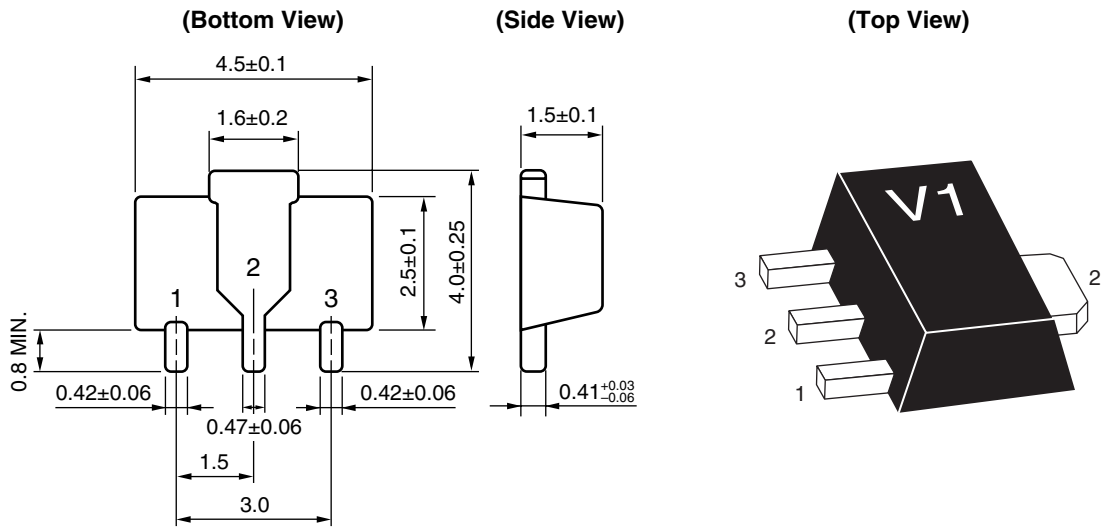
<R> **TYPICAL CHARACTERISTICS** ($T_A = +25^\circ\text{C}$, $f = 1.9\text{ GHz}$, $I_{Dset} = 200\text{ mA}$, unless otherwise specified)



Remark The graphs indicate nominal characteristics.

PACKAGE DIMENSIONS

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



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) : 260°C or below Time at peak temperature : 10 seconds or less Time at temperature of 220°C or higher : 60 seconds or less Preheating time at 120 to 180°C : 120±30 seconds Maximum number of reflow processes : 3 times Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	IR260
Wave Soldering	Peak temperature (molten solder temperature) : 260°C or below Time at peak temperature : 10 seconds or less Preheating temperature (package surface temperature) : 120°C or below Maximum number of flow processes : 1 time Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	WS260
Partial Heating	Peak temperature (terminal temperature) : 350°C or below Soldering time (per side of device) : 3 seconds or less Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	HS350

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

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