

SILICON POWER MOS FET NE5511279A

7.5 V OPERATION SILICON RF POWER LD-MOS FET FOR UHF-BAND 10 W TRANSMISSION AMPLIFIERS

DESCRIPTION

The NE5511279A is an N-channel silicon power laterally diffused MOS FET specially designed as the transmission power amplifier for 7.5 V Radio Systems. Dies are manufactured using our NEWMOS1 technology and housed in a surface mount package. This device can deliver 40.0 dBm output power with 48% power added efficiency at 900 MHz under the 7.5 V supply voltage.

FEATURES

•	High output power	: $P_{out} = 40.0 \text{ dBm TYP}$. (f = 900 MHz, VDs = 7.5 V, $P_{in} = 27 \text{ dBm}$, IDset = 400 mA)
		: Pout = 40.5 dBm TYP. (f = 460 MHz, VDs = 7.5 V, Pin = 25 dBm, IDset = 400 mA)
•	High power added efficiency	: η_{add} = 48% TYP. (f = 900 MHz, VDs = 7.5 V, Pin = 27 dBm, IDset = 400 mA)
		: η_{add} = 50% TYP. (f = 460 MHz, VDs = 7.5 V, Pin = 25 dBm, IDset = 400 mA)
•	High linear gain	: GL = 15.0 dB TYP. (f = 900 MHz, VDs = 7.5 , Pin = 5 dBm V, IDset = 400 mA)
		: GL = 18.5 dB TYP. (f = 460 MHz, VDs = 7.5 V, Pin = 5 dBm, IDset = 400 mA)
•	Surface mount package	: 5.7 × 5.7 × 1.1 mm MAX.
•	Single supply	: V _{DS} = 2.8 to 8.0 V

APPLICATIONS

- 460 MHz Radio Systems
- 900 MHz Radio Systems

ORDERING INFORMATION

Part Number	Package	Marking	Supplying Form
NE5511279A-T1	79A	W3	 12 mm wide embossed taping Gate pin face the perforation side of the tape Qty 1 kpcs/reel
NE5511279A-T1A			 12 mm wide embossed taping Gate pin face the perforation side of the tape Qty 5 kpcs/reel

Remark To order evaluation samples, contact your nearby sales office. Part number for sample order: NE5511279A-A

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

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.

ABSOLUTE MAXIMUM RATINGS (TA = +25°C)

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

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	$V_{\text{DS}}^{\text{ Note}}$	20	V
Gate to Source Voltage	Vgs	6.0	V
Drain Current	lь	3.0	А
Total Power Dissipation	Ptot	20	W
Channel Temperature	Tch	125	°C
Storage Temperature	Tstg	-55 to +125	°C

Note VDS will be used under 12 V on RF operation.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Drain to Source Voltage	Vds		-	7.5	8.0	V
Gate to Source Voltage	Vgs		0	2.0	3.0	V
Drain Current	lь	Duty Cycle \leq 50%, Ton \leq 1 s	-	2.5	3.0	А
Input Power	Pin	f = 900 MHz, V _{DS} = 7.5 V	I	27	30	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 Leak Current	Igss	Vgs = 6.0 V	_	-	100	nA
Drain to Source Leakage Current (Zero Gate Voltage Drain Current)	IDSS	V _{DS} = 8.5 V	_	_	100	nA
Gate Threshold Voltage	Vth	VDS = 4.8 V, IDS = 1.5 mA	1.0	1.5	2.0	V
Thermal Resistance	Rth	Channel to Case	_	5	-	°C/W
Transconductance	gm	Vbs = 3.5 V, lbs = 900 mA	-	2.3	-	S
Drain to Source Breakdown Voltage	BVDSS	Ibss = 15 μ A	20	24	-	V
Output Power	Pout	f = 900 MHz, Vbs = 7.5 V,	38.5	40.0	-	dBm
Drain Current	lь	Pin = 27 dBm,	-	2.5	-	А
Power Added Efficiency	η add	I _{Dset} = 400 mA (RF OFF)	42	48	-	%
Linear Gain	G∟ ^{Note}		-	15.0	-	dB
Output Power	Pout	f = 460 MHz, Vbs = 7.5 V,	-	40.5	-	dBm
Drain Current	lь	P _{in} = 25 dBm,	-	2.75	-	А
Power Added Efficiency	η add	I _{Dset} = 400 mA (RF OFF)	-	50	-	%
Linear Gain	GL Note		-	18.5	-	dB

Note $P_{in} = 5 dBm$

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.

TYPICAL CHARACTERISTICS (TA = +25°C, VDS = 7.5 V, IDset = 400 mA)





S-PARAMETERS

- S-parameters and noise parameters are provided on our Web site in a format (S2P) that enables the direct import of the parameters to microwave circuit simulators without the need for keyboard inputs.
- · Click here to download S-parameters.
- [RF and Microwave] ® [Device Parameters]
- URL http://www.necel.com/microwave/en/

PACKAGE DIMENSIONS

79A (UNIT: mm)



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).