CEL

NEC's 7.5 V UHF BAND RF POWER SILICON LD-MOS FET

NE5511279A

FEATURES

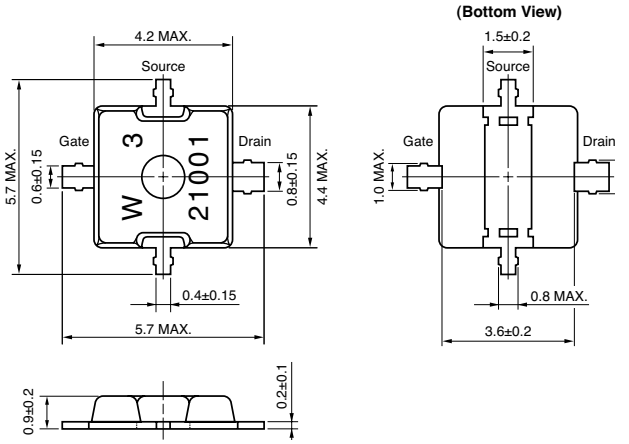
- **HIGH OUTPUT POWER:**
  P_{out} = 40.0 dBm TYP., f = 900 MHz, V_{DS} = 7.5 V,
  P_{out} = 40.5 dBm TYP., f = 460 MHz, V_{DS} = 7.5 V,
- **HIGH POWER ADDED EFFICIENCY:**
  η_{add} = 48% TYP., f = 900 MHz, V_{DS} = 7.5 V,
  η_{add} = 50% TYP., f = 460 MHz, V_{DS} = 7.5 V,
- **HIGH LINEAR GAIN:**
  G_L = 15.0 dB TYP., f = 900 MHz, V_{DS} = 7.5 V,
  G_L = 18.5 dB TYP., f = 460 MHz, V_{DS} = 7.5 V,
- **SURFACE MOUNT PACKAGE:**
  5.7 x 5.7 x 1.1 mm MAX
- **SINGLE SUPPLY:**
  V_{DS} = 2.8 to 8.0 V

APPLICATIONS

- **UHF RADIO SYSTEMS**
- **CELLULAR REPEATERS**
- **TWO-WAY RADIOS**
- **FRS/GMRS**
- **FIXED WIRELESS**

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE 79A



DESCRIPTION

NEC's NE5511279A is an N-Channel silicon power laterally diffused MOSFET specially designed as the transmission power amplifier for 7.5 V radio systems. Die are manufactured using NEC's 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 using a 7.5 V supply voltage.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT	TEST CONDITIONS
P_{out}	Output Power	38.5	40.0	–	dBm	f = 900 MHz, V_{DS} = 7.5 V,
I_D	Drain Current	–	2.5	–	A	P_{in} = 27 dBm,
η_{add}	Power Added Efficiency	42	48	–	%	I_{DSQ} = 400 mA (RF OFF)
G_L	Linear Gain	–	15.0	–	dB	P_{in} = 5 dBm
P_{out}	Output Power	–	40.5	–	dBm	f = 460 MHz, V_{DS} = 7.5 V,
I_D	Drain Current	–	2.75	–	A	P_{in} = 25 dBm,
η_{add}	Power Added Efficiency	–	50	–	%	I_{DSQ} = 400 mA (RF OFF)
G_L	Linear Gain	–	18.5	–	dB	P_{in} = 5 dBm
I_{GSS}	Gate to Source Leak Current	–	–	100	nA	V_{GS} = 6.0 V
I_{DSS}	Drain to Source Leakage Current (Zero Gate Voltage Drain Current)	–	–	100	nA	V_{DS} = 8.5 V
V_{th}	Gate Threshold Voltage	1.0	1.5	2.0	V	V_{DS} = 4.8 V, I_{DS} = 1.5 mA
R_{th}	Thermal Resistance	–	5	–	°C/W	Channel to Case
g_m	Transconductance	–	2.3	–	S	V_{DS} = 3.5 V, I_{DS} = 900 mA
BV_{DSS}	Drain to Source Breakdown Voltage	20	24	–	V	I_{DSS} = 15 μA

Notes:

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

ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25 °C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{DS}	Drain Supply Voltage[2]	V	20.0
V_{GS}	Gate Supply Voltage	V	6.0
I_D	Drain Current	A	3.0
P_{TOT}	Total Power Dissipation	W	20
T_{CH}	Channel Temperature	°C	125
T_{STG}	Storage Temperature	°C	-55 to +125

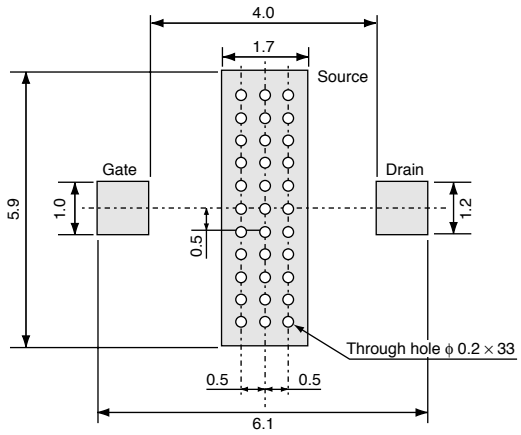
Note:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. V_{DS} must be used under 12 V on RF operation.

RECOMMENDED OPERATING LIMITS

SYMBOLS	PARAMETERS	UNITS	TYP	MAX
V_{DS}	Drain to Source Voltage	V	7.5	8.0
V_{GS}	Gate Supply Voltage	V	2.0	3.0
I_{DS}	Drain Current[1]	A	2.5	3.0
P_{IN}	Input Power f = 900 MHz, V_{DS} = 7.5 V	dBm	27	30

P.C.B. LAYOUT (Units in mm)

79A PACKAGE



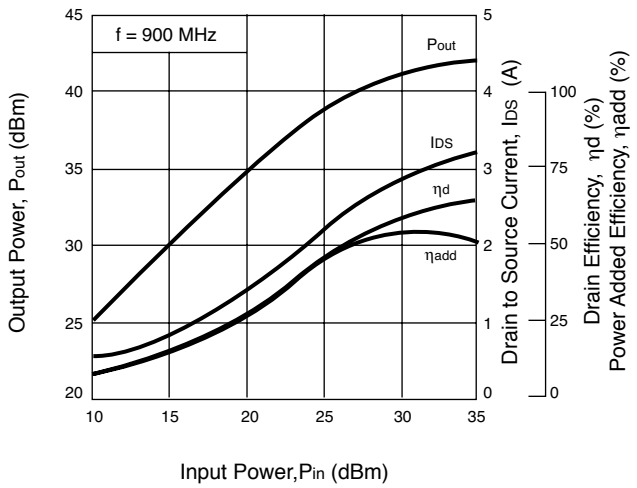
Note:
Use rosin or other material to prevent solder from penetrating through-holes.

ORDERING INFORMATION

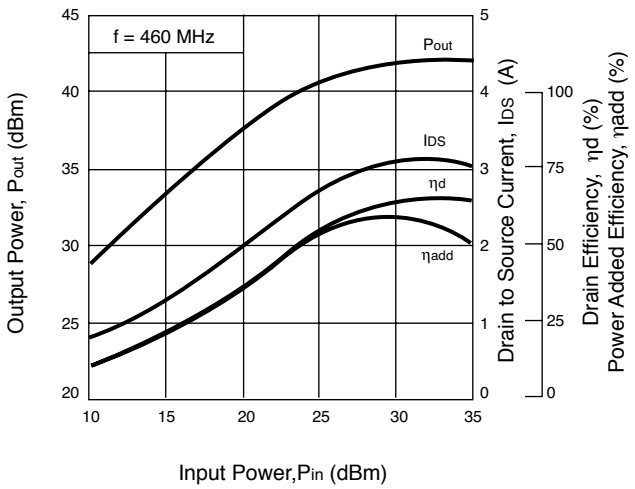
PART NUMBER	QTY
NE5511279A-T1-A	• 12 mm wide embossed taping. • Gate pin faces the perforation side of the tape. • 1 Kpcs/Reel
NE5511279A-T1A-A	

TYPICAL PERFORMANCE CURVES (T_A = 25°C)

OUTPUT POWER, DRAIN CURRENT, ηd, ηadd vs. INPUT POWER



OUTPUT POWER, DRAIN CURRENT, ηd, ηadd vs. INPUT POWER



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).

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Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
Lead (Pb)	< 1000 PPM	-A	-AZ
		Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.