

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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LDMOS FIELD EFFECT TRANSISTOR

NEM090853P-28

N-CHANNEL SILICON POWER LDMOS FET FOR UHF-BAND POWER AMPLIFIER

DESCRIPTION

The NEM090853P-28 is an N-channel enhancement-mode lateral MOS FET designed for 0.8 to 1.0 GHz, 90 W single-end power amplifier applications, such as, GSM/EDGE/N-CDMA cellular base station. Dies are manufactured using our NEWMOS technology (our WSi gate lateral MOS FET), and its nitride surface passivation and triple layer aluminum silicon metalization offer a high degree of reliability.

FEATURES

- High 1 dB compression output power : $P_{O(1\text{ dB})} = 90\text{ W TYP.}$ ($V_{DS} = 28\text{ V}$, $I_{Dset} = 800\text{ mA}$, $f = 920\text{ to }960\text{ MHz CW}$)
- High linear gain : $G_L = 19.5\text{ dB TYP.}$ ($V_{DS} = 28\text{ V}$, $I_{Dset} = 800\text{ mA}$, $f = 920\text{ to }960\text{ MHz CW}$)
- High drain efficiency : $\eta_d = 57\% \text{ TYP.}$ ($V_{DS} = 28\text{ V}$, $I_{Dset} = 800\text{ mA}$, $f = 920\text{ to }960\text{ MHz CW}$)
- Low intermodulation distortion : $IM_3 = -37\text{ dBc TYP.}$ ($V_{DS} = 28\text{ V}$, $I_{Dset} = 800\text{ mA}$, $f = 960/960.1\text{ MHz}$, $P_{out} = 43\text{ dBm (2 tones)}$)
: $IM_3 = -45\text{ dBc TYP.}$ ($V_{DS} = 28\text{ V}$, $I_{Dset} = 800\text{ mA}$, $f = 880/880.1\text{ MHz}$, $P_{out} = 40\text{ dBm (2 tones)}$)
- Internal matched (Input and Output) for ease of use
- Low cost hollow plastic packages
- 100% screening
- Integrated ESD protection
- Effective prevention against humidity
- Excellent stability against HCI (Hot Carrier Injection)

APPLICATION

- Digital cellular base station PA : GSM/EDGE/N-CDMA etc.

ORDERING INFORMATION

Part Number	Package	Supplying Form
NEM090853P-28	T-97M (3P)	ESD protective envelope

Remark To order evaluation samples, contact your nearby sales office.
The unit sample quantity is 1 pcs.

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

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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

ABSOLUTE MAXIMUM RATINGS ($T_A = +25^{\circ}\text{C}$, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V_{DS}	65	V
Gate to Source Voltage	V_{GS}	7	V
Drain Current	I_D	10.0	A
Total Device Dissipation	P_{tot}^{Note}	250	W
Thermal Resistance	R_{th}	0.7	$^{\circ}\text{C/W}$
Channel Temperature	T_{ch}	200	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^{\circ}\text{C}$

Note $T_C = 25^{\circ}\text{C}$

RECOMMENDED OPERATING RANGE

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Drain to Source Voltage	V_{DS}	–	28	30	V
Gate to Source Voltage	V_{GS}	1.5	1.9	2.5	V
Input Power	P_{in}	–	32	36	dBm

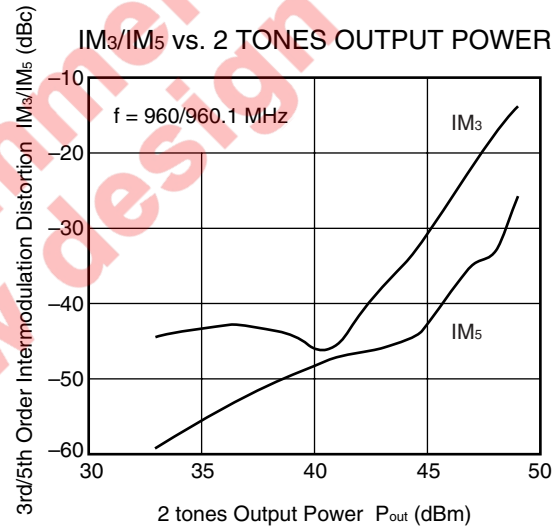
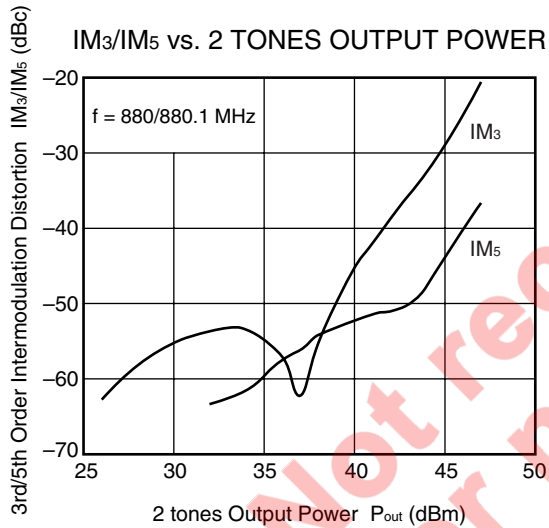
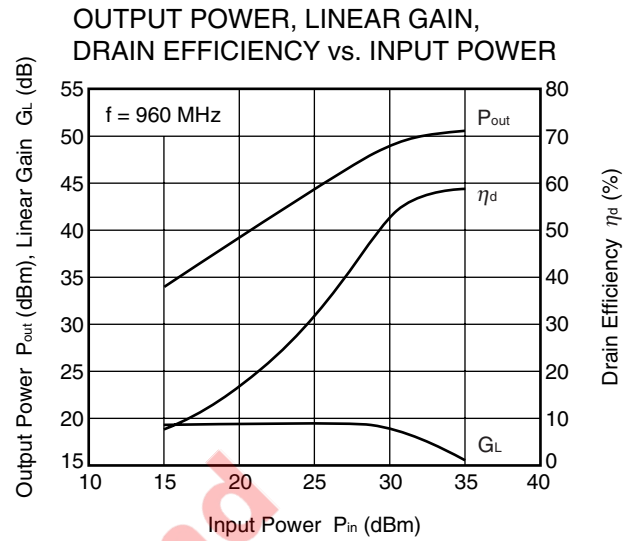
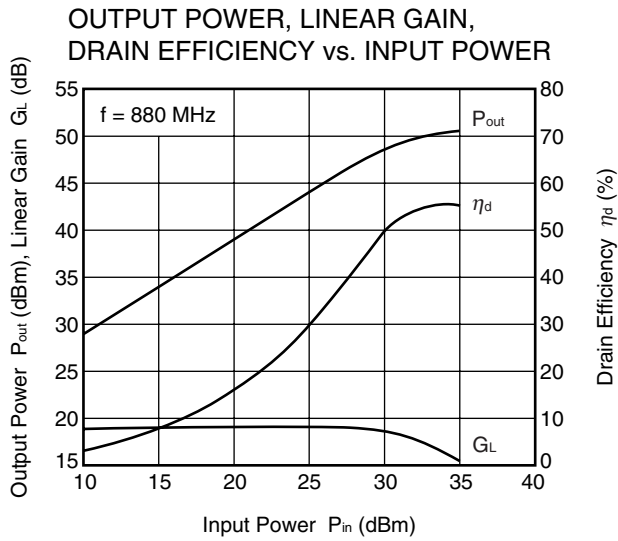
Not recommended
for new design

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Gate to Source Leak Current	I _{GSS}	V _{GSS} = 5V	–	–	1	μA
Drain to Source Leakage Current (Zero Gate Voltage Drain Current)	I _{DSS}	V _{DSS} = 65 V	–	–	1	mA
Gate Threshold Voltage	V _{th}	V _{DS} = 10 V, I _{DS} = 1 mA	1.0	1.4	2.0	V
Transconductance	g _m	V _{DS} = 20 V, I _{DS} = 2 A ± 100 mA	–	4.8	–	S
Drain to Source Breakdown Voltage	BV _{DSS}	I _{DSS} = 10 μA	65	75	–	V
Gain 1 dB Compression Output Power	P _O (1 dB)	f = 920 to 960 MHz, P _{in} = 32 dBm,	–	49.5	–	dBm
Linear Gain	G _L ^{Note}	V _{DS} = 28 V, I _{Dset} = 800 mA	18.5	19.5	–	dB
Output Power	P _{out}		49.3	50	–	dBm
Drain Efficiency	η _d		50	57	–	%
Power Added Efficiency	η _{add}		–	56	–	%
3rd Order Intermodulation Distortion	IM ₃		–	–37	–	dBc
Gain 1 dB Compression Output Power	P _O (1 dB)	f = 880 MHz, P _{in} = 32 dBm,	–	49.5	–	dBm
Linear Gain	G _L ^{Note}	V _{DS} = 28 V, I _{Dset} = 800 mA	–	19.0	–	dB
Output Power	P _{out}		–	50	–	dBm
Drain Efficiency	η _d		–	57	–	%
Power Added Efficiency	η _{add}		–	56	–	%
3rd Order Intermodulation Distortion	IM ₃		–	–45	–	dBc

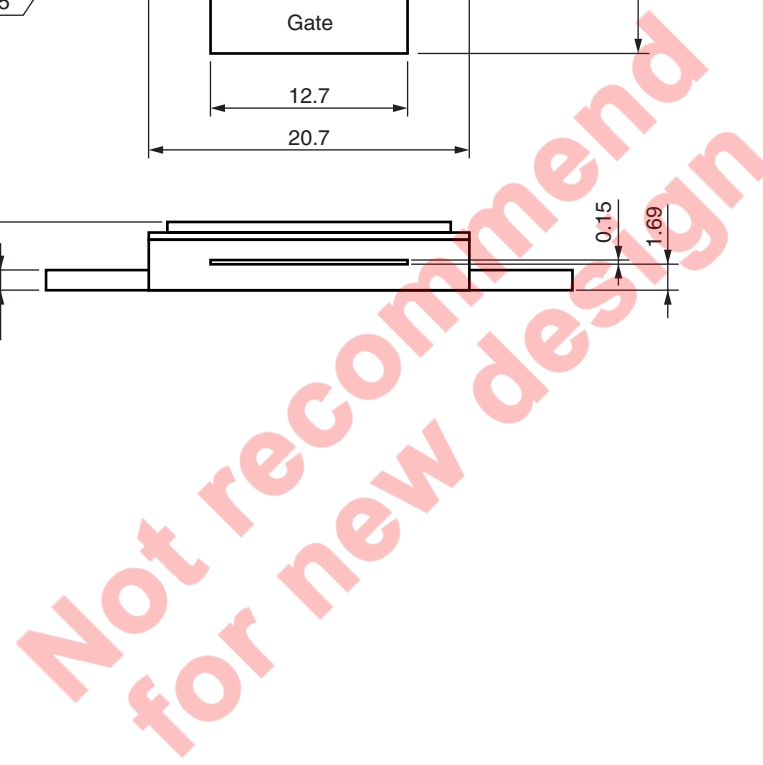
Note P_{in} = 22 dBm

TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, $V_{DS} = 28\text{ V}$, $I_{Dset} = 800\text{ mA}$, unless otherwise specified)



Remark The graphs indicate nominal characteristics.

T-97M (3P) (UNIT: mm)



RECOMMENDED MOUNTING CONDITIONS FOR CORRECT USE

- (1) Fix to a heat sink or mount surface completely with screws at the two holes of the flange.
- (2) The recommended torque strength of the screws is 29.4 N·cm typical using M3 type screws.
- (3) The recommended flatness of the mount surface is less than $\pm 10 \mu\text{m}$ (roughness of surface is $\nabla\nabla\nabla$).

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
Partial Heating	Peak temperature (pin temperature)	: 350°C or below
	Soldering time (per pin of device)	: 3 seconds or less
	Maximum chlorine content of rosin flux (% mass)	: 0.2%(Wt.) or below

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

Not recommended
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M8E 00.4-0110

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NEC Compound Semiconductor Devices, Ltd. <http://www.ncsd.necel.com/>

E-mail: salesinfo@ml.ncsd.necel.com (sales and general)

techinfo@ml.ncsd.necel.com (technical)

5th Sales Group, Sales Division TEL: +81-44-435-1588 FAX: +81-44-435-1579

NEC Compound Semiconductor Devices Hong Kong Limited

E-mail: ncsd-hk@elhk.nec.com.hk (sales, technical and general)

Hong Kong Head Office TEL: +852-3107-7303 FAX: +852-3107-7309

Taipei Branch Office TEL: +886-2-8712-0478 FAX: +886-2-2545-3859

Korea Branch Office TEL: +82-2-558-2120 FAX: +82-2-558-5209

NEC Electronics (Europe) GmbH <http://www.ee.nec.de/>

TEL: +49-211-6503-0 FAX: +49-211-6503-1327

California Eastern Laboratories, Inc. <http://www.cel.com/>

TEL: +1-408-988-3500 FAX: +1-408-988-0279