NEC

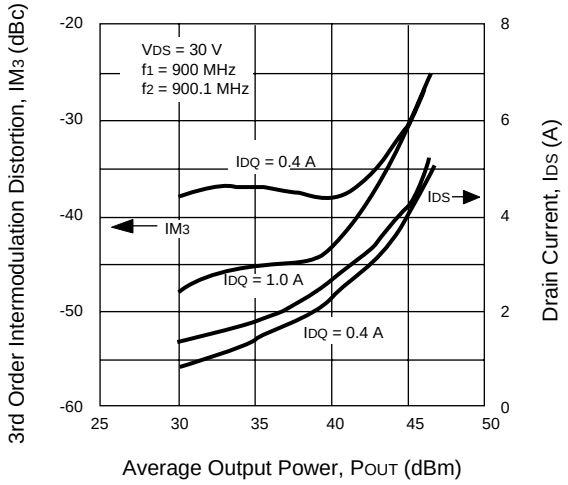
High Power N-Channel Silicon MOSFET For Cellular Base Stations

NEM0995F01-30

FEATURES

- **HIGH OUTPUT POWER:** 95 W
- **HIGH LINEAR GAIN:** 12 dB
- **HIGH DYNAMIC RANGE**
- **LOW INTERMODULATION DISTORTION**
- **INTERNALLY MATCHED FOR THE 820-960 MHz BAND (INPUT ONLY)**
- **PUSH-PULL STRUCTURE**

3rd Order INTERMODULATION DISTORTION AND DRAIN CURRENT vs. OUTPUT POWER



DESCRIPTION

The NEM0995F01-30 is a high power enhancement mode Silicon MOSFET. Its design employs a vertical geometry for high drain to source breakdown voltage, a 1.3 μm x 28.8 mm gate, a gold metallization system, and plasma silicon nitride layer on the surface of the transistor for long life and reliable operation. The NEM0995F01-30 uses two chips in a push-pull configuration and internal input pre-matching circuitry to provide broadband impedance transformation in the 820-960 MHz band, making it ideal for Cellular Base Station Applications.

The NEM0995F01-30 transistors are manufactured to NEC's stringent quality assurance standards to ensure highest reliability and consistent superior performance.

ELECTRICAL CHARACTERISTICS (T_C = 25°C)

	PART NUMBER PACKAGE OUTLINE			NEM0995F01-30 F01			
	SYMBOLS	**CHARACTERISTICS**	**UNITS**	**MIN**	**TYP**	**MAX**	**TEST CONDITIONS**
Functional Characteristics	P_{OUT}	Output Power	W	80	95		960 MHz; P_{IN} = 40 dBm
	η_D	Drain Efficiency	%	35	43		I_{DQ} = 200 mA x 2
	G_L	Linear Gain	dB	11	12.4		V_{DD} = 30 V; P_{IN} = 30 dBm
Electrical DC Characteristics	I_{DSS}	Drain-Source Leakage Current	mA			2.0	V_{DS} = 60 V; V_{GS} = 0 V
	$V_{GS\ (OFF)}$	Gate to Source Cutoff Voltage	V	1		4	V_{DS} = 5 V; I_{DS} = 50 mA
	I_{GSS}	Gate-Source Leakage Current	μA			1	V_{GS} = 7 V; V_{DS} = 0 V
	R_{TH}	Thermal Resistance	°C/W			0.6	Channel to Case

ABSOLUTE MAXIMUM RATINGS[1]

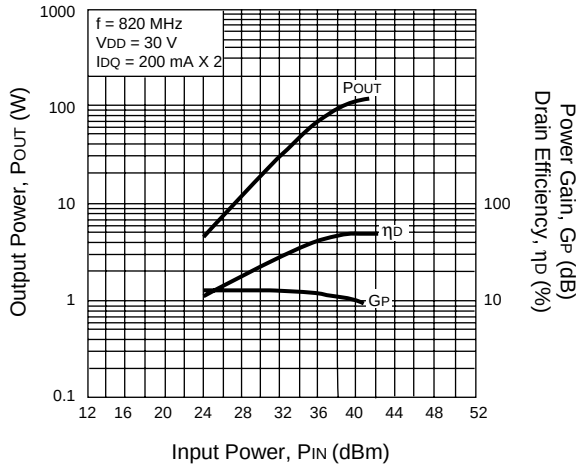
(T_C = 25 °C unless otherwise noted)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{DSS}	Drain to Source Voltage	V	60
V_{GSS}	Gate to Source Voltage	V	20
I_D	Drain Current	A	15
P_T	Total Power Dissipation	W	290
T_{CH}	Channel Temperature	°C	200
T_{STG}	Storage Temperature	°C	-65 to +150

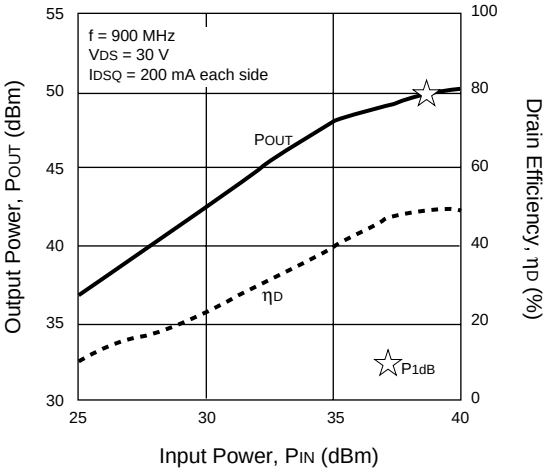
Note:
1. Operation in excess of any one of these parameters may result in permanent damage.

TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

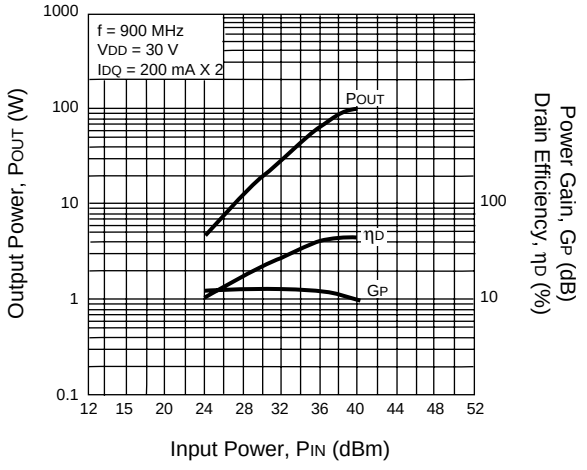
OUTPUT POWER, DRAIN EFFICIENCY AND POWER GAIN vs. INPUT POWER



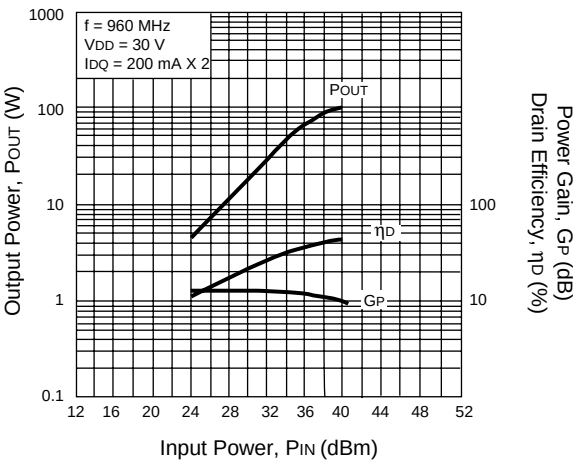
OUTPUT POWER AND DRAIN EFFICIENCY vs. INPUT POWER



OUTPUT POWER, DRAIN EFFICIENCY AND POWER GAIN vs. INPUT POWER

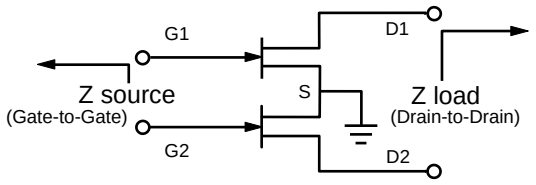


OUTPUT POWER, DRAIN EFFICIENCY AND POWER GAIN vs. INPUT POWER



LARGE SIGNAL IMPEDANCES (Side to Side)

f (MHz)	Z_{SOURCE}(Ω) (Gate-to-Gate)	Z_{LOAD} (Ω) (Drain-to-Drain)
820	6.52 – j5.52	2.34 – j0.91
900	8.86 – j5.49	2.78 – j3.23
960	10.36 – j4.79	2.95 – j3.37
980	12.0 – j4.0	2.4 – j4.4

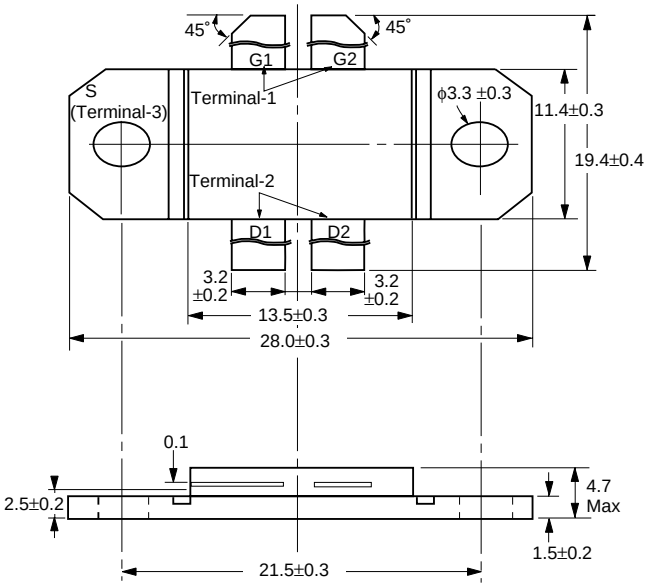


Z_{SOURCE} = Impedance of the external input matching circuit as seen from gate to gate.

Z_{LOAD} = Impedance of the external output matching circuit as seen from drain to drain.

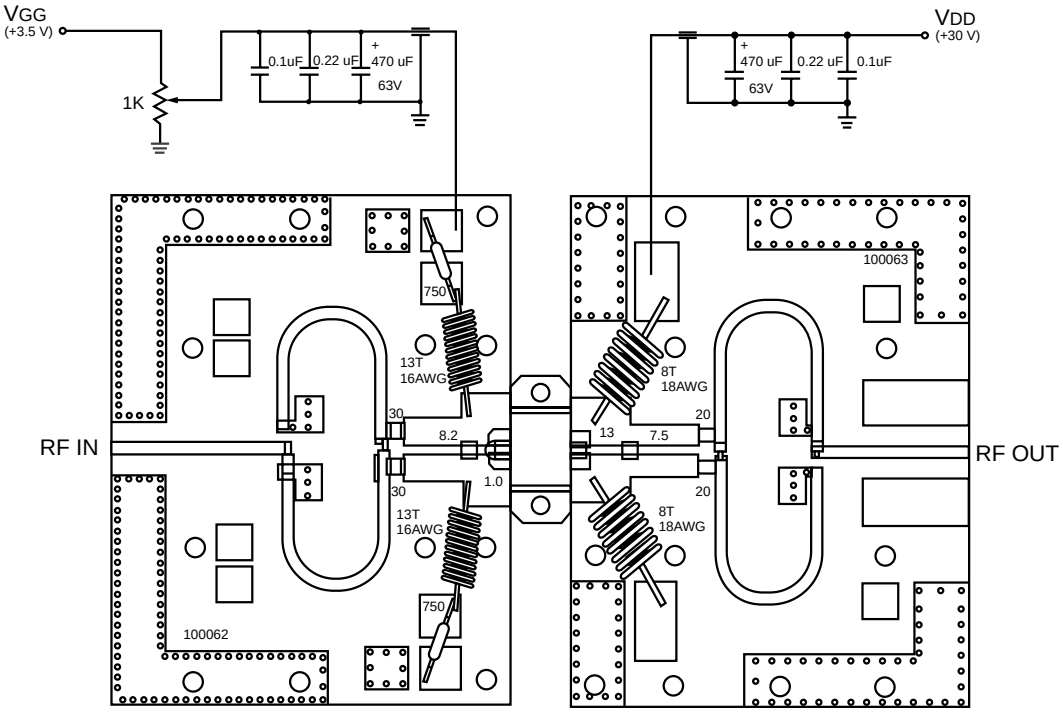
OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE F01



G1, G2: Gate
D1, D2: Drain
S: Source

TEST CIRCUIT



Notes: 1. Circuit board: Er = 2.6, thickness = 0.8 mm (0.031").
2. Resistances are in ohms, capacitances are in picofarads unless otherwise noted.
3. Semi rigid coaxial cable: Er = 2.1, Zo = 250 ohms, external diameter = 2.3 mm (0.090"), total jacket length = 57 mm (2.25").