PRELIMINARY DATA SHEET

NEC

GaAs FET

NES1823M-45

45 W L, S-BAND PUSH-PULL POWER GaAs FET

DESCRIPTION

The NES1823M-45 is a 45 W push-pull type GaAs FET designed for high power transmitter applications for IMT-2000, PCS, and PDC base station systems. It is capable of delivering 45 W of output power (CW) with high linear gain, high efficiency and excellent distortion under the condition of 12 V operation. Its primary band is 1.8 to 2.3 GHz. The device employs 0.7 μm Tungsten Silicide gates, via holes, plated heat sink, and silicon dioxide passivation for superior performance, thermal characteristics, and reliability.

FEATURES

- Push-pull type GaAs FET
- V_{DS} = 12.0 V operation
- High output power: P_{out} = 45 W TYP.
- High linear gain: G_L = 12.0 dB TYP.
- High power added efficiency: η_{add} = 40% TYP. @ V_{DS} = 12.0 V, I_{Dset} = 4.0 A (total), f = 2.20 GHz
- Hollow plastic package

ORDERING INFORMATION

Part Number	Package	Supplying Form
NES1823M-45	T-86M	ESD protective tray

Remark To order evaluation samples, contact your neaby sales office.

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

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ABSOLUTE MAXIMUM RATINGS (T_A = +25°C, unless otherwise specified)

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

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V_{DS}	19	V
Gate to Source Voltage	V_{GSO}	–7	V
Gate to Drain Voltage	V_{GDO}	–22	V
Gate Current	I_G	240	mA
Total Power Dissipation	P_{tot} Note	165	W
Channel Temperature	T_{ch}	175	°C
Storage Temperature	T_{stg}	–65 to +150	°C

Note T_C = +25°C

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Drain to Source Voltage	V_{DS}		–	12.0	12.0	V
Set Drain Current	I_{Dset}	V_{DS} = 12.0 V, RF OFF	–	4.0	6.0	A
Channel Temperature	T_{ch}		–	–	+150	°C
Gain Compression (CW)	Gcomp		–	–	3.0	dB
Gate Resistance	R_g Note		–	–	30	Ω

Note R_g is the series resistance between the gate supply and the FET gate.

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

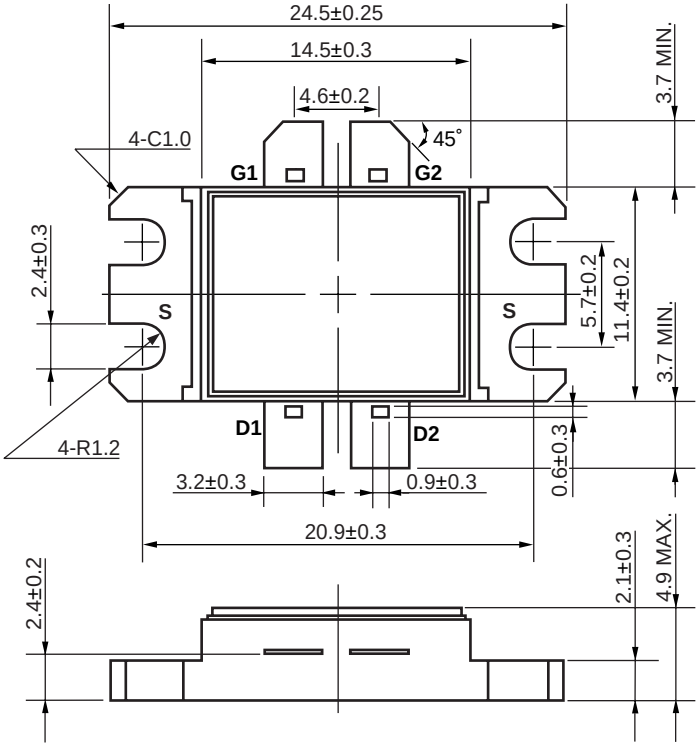
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Pinch-off Voltage	V_p	V_{DS} = 2.5 V, I_D = 110 mA	–3.5	–2.8	–	V
Thermal Resistance	R_{th}	Channel to Case	–	0.7	0.9	°C/W
Output Power	P_{out}	f = 2.20 GHz CW, V_{DS} = 12.0 V,	45.5	46.5	–	dBm
Drain Current	I_D	P_{in} = 37.5 dBm, R_g = 30 Ω,	–	9	–	A
Power Added Efficiency	η_{add}	I_{Dset} = 4.0 A Total (RF OFF) Note1	–	40	–	%
Linear Gain	G_L Note2		11.0	12.0	–	dB

Notes1. I_{Dset} = 2.0 A each drain

2. P_{in} = 21 dBm

PACKAGE DIMENSIONS

T-86M (UNIT: mm)



PIN CONNECTIONS

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

RECOMMENDED MOUNTING CONDITIONS FOR CORRECT USE

(1) Fix to a heat sink or mount surface completely with screws at the four holes of the flange.

(2) The recommended torque strength of the screws is 29.4 N·cm typical using M2.3 type screws.

(3) The recommended flatness of the mount surface is less than ±10 μm (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) 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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Caution GaAs Products	This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points. • Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below. 1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials. 2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal. • Do not burn, destroy, cut, crush, or chemically dissolve the product. • Do not lick the product or in any way allow it to enter the mouth.

▶**For further information, please contact**

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