



# SD56120M

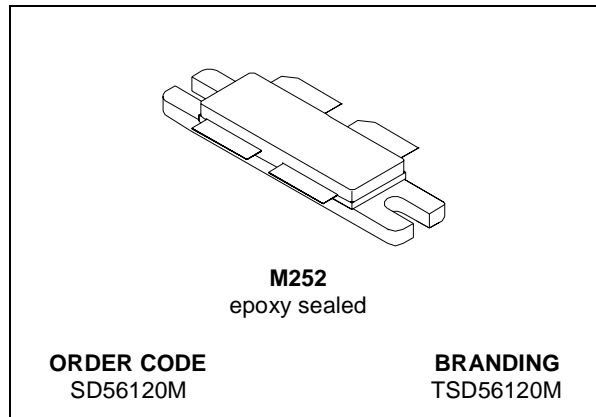
## RF POWER TRANSISTORS

### The *LdmoST* FAMILY

ADVANCE DATA

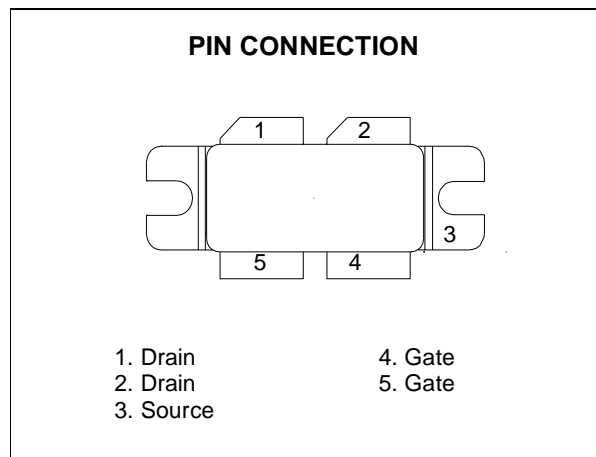
#### N-CHANNEL ENHANCEMENT-MODE LATERAL MOSFETs

- EXCELLENT THERMAL STABILITY
- COMMON SOURCE CONFIGURATION, PUSH-PULL
- $P_{OUT} = 120\text{ W}$  WITH 13 dB gain @ 860 MHz /32V
- BeO FREE PACKAGE
- INTERNAL INPUT MATCHING



#### DESCRIPTION

The SD56120M is a common source N-Channel enhancement-mode lateral Field-Effect RF power transistor designed for broadband commercial and industrial applications at frequencies up to 1.0 GHz. The SD56120M is designed for high gain and broadband performance operating in common source mode at 32 V. Its internal matching makes it ideal for TV broadcast applications requiring high linearity.



#### ABSOLUTE MAXIMUM RATINGS ( $T_{CASE} = 25^{\circ}\text{C}$ )

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-Source Voltage	65	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current	14	A
$P_{DISS}$	Power Dissipation (@ $T_c = 70^{\circ}\text{C}$ )	236	W
$T_j$	Max. Operating Junction Temperature	200	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature	-65 to +150	$^{\circ}\text{C}$

#### THERMAL DATA

$R_{th(j-c)}$	Junction -Case Thermal Resistance	0.55	$^{\circ}\text{C/W}$
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## ELECTRICAL SPECIFICATION (T<sub>CASE</sub> = 25°C)

### STATIC (Per Section)

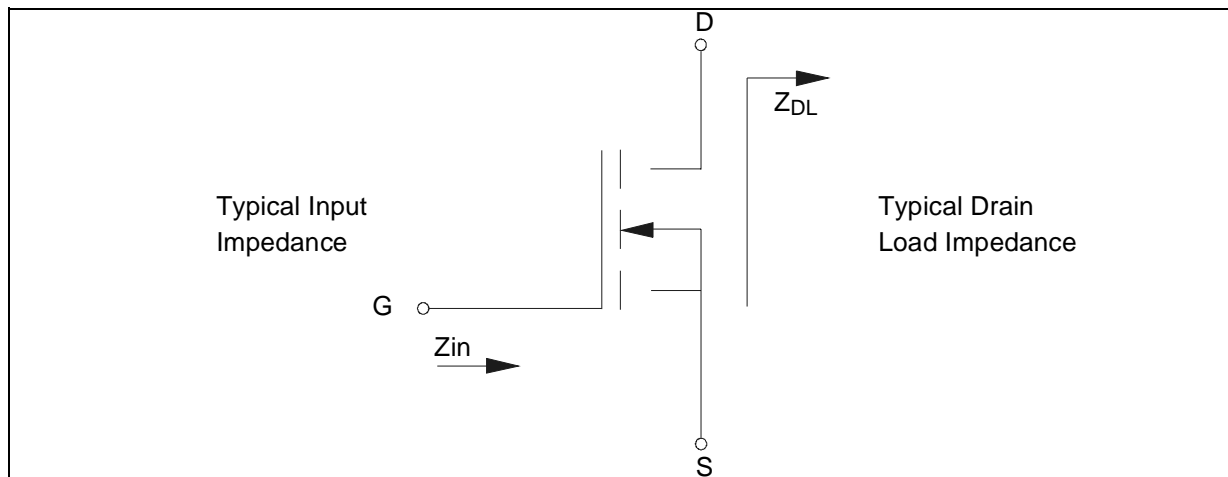
Symbol	Test Conditions		Min.	Typ.	Max.	Unit
V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V	I <sub>DS</sub> = 10 mA	65			V
I <sub>DSS</sub>	V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 28 V			1	μA
I <sub>GSS</sub>	V <sub>GS</sub> = 20 V	V <sub>DS</sub> = 0 V			1	μA
V <sub>GS(Q)</sub>	V <sub>DS</sub> = 28 V	I <sub>D</sub> = 100 mA	2.0		5.0	V
V <sub>DS(ON)</sub>	V <sub>GS</sub> = 10 V	I <sub>D</sub> = 3 A		0.7	0.8	V
G <sub>FS</sub>	V <sub>DS</sub> = 10 V	I <sub>D</sub> = 3 A		3		mho
C <sub>ISS</sub> *	V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 28 V		221		pF
C <sub>OSS</sub>	V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 28 V		48.9		pF
C <sub>RSS</sub>	V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 28 V		2.25		pF

\* Includes Internal Input Moscap.

### DYNAMIC

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
P <sub>OUT</sub>	V <sub>DD</sub> = 32 V	I <sub>DQ</sub> = 400 mA	120			W
G <sub>PS</sub>	V <sub>DD</sub> = 32 V	I <sub>DQ</sub> = 400 mA	13	16		dB
η <sub>D</sub>	V <sub>DD</sub> = 32 V	I <sub>DQ</sub> = 400 mA	50			%
Load mismatch	V <sub>DD</sub> = 32 V	I <sub>DQ</sub> = 400 mA	10:1			VSWR

### IMPEDANCE DATA

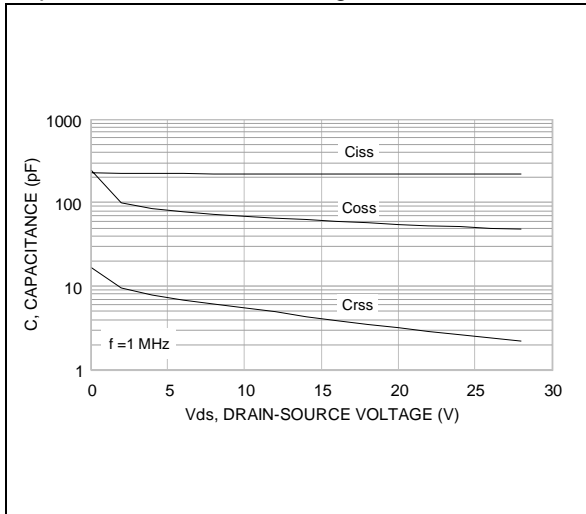


FREQ.	Z <sub>IN</sub> (Ω)	Z <sub>DL</sub> (Ω)
860 MHz	5.57 + j 3.488	4.21 - j 2.88

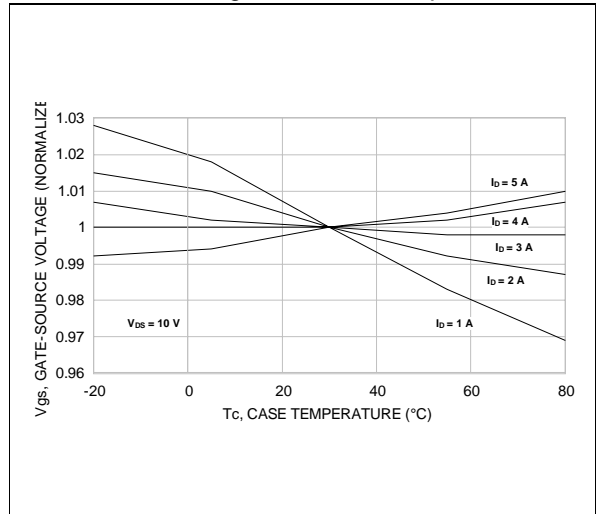
Measured drain to drain and gate to gate respectively.

TYPICAL PERFORMANCE

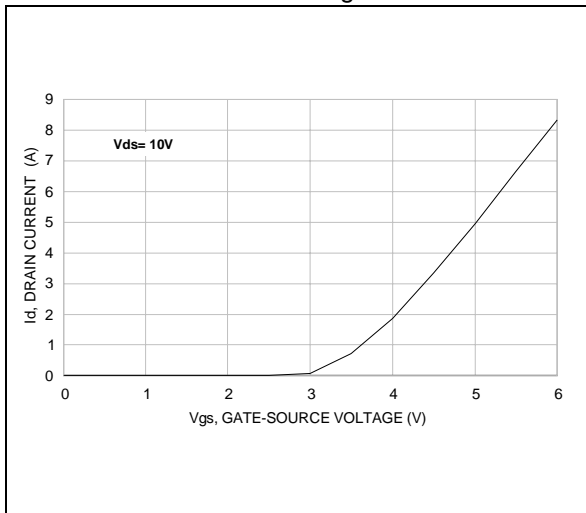
Capacitance vs. Drain Voltage



Gate-Source Voltage vs. Case Temperature



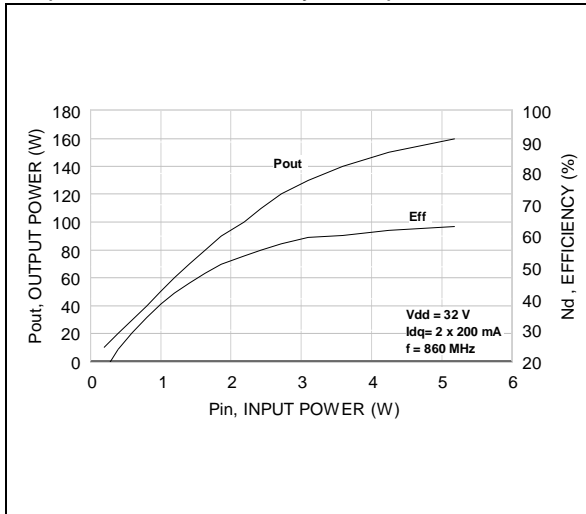
Drain Current vs. Gate Voltage



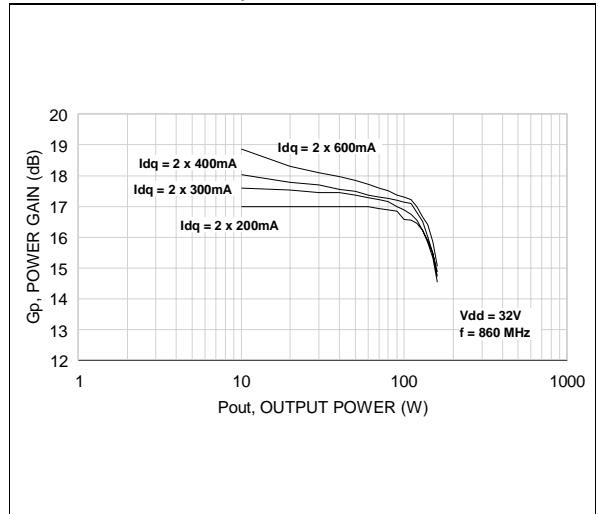
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## TYPICAL PERFORMANCE

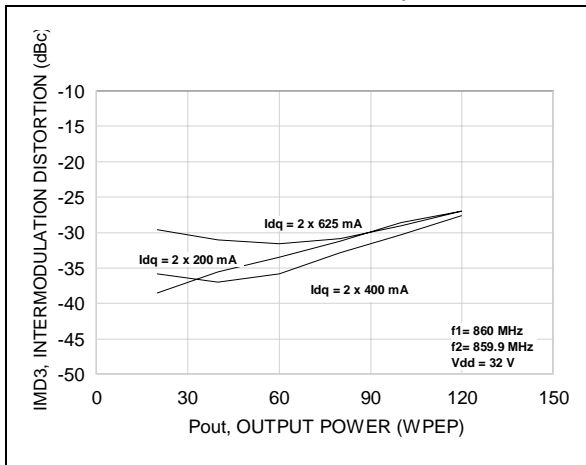
### Output Power & Efficiency vs. Input Power



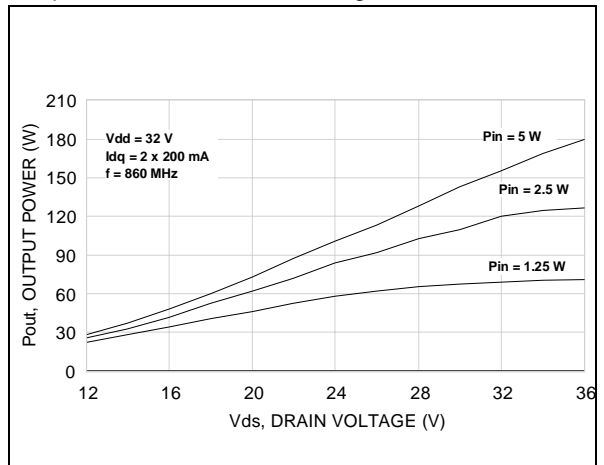
### Power Gain vs. Output Power



### Intermodulation Distortion vs. Output Power

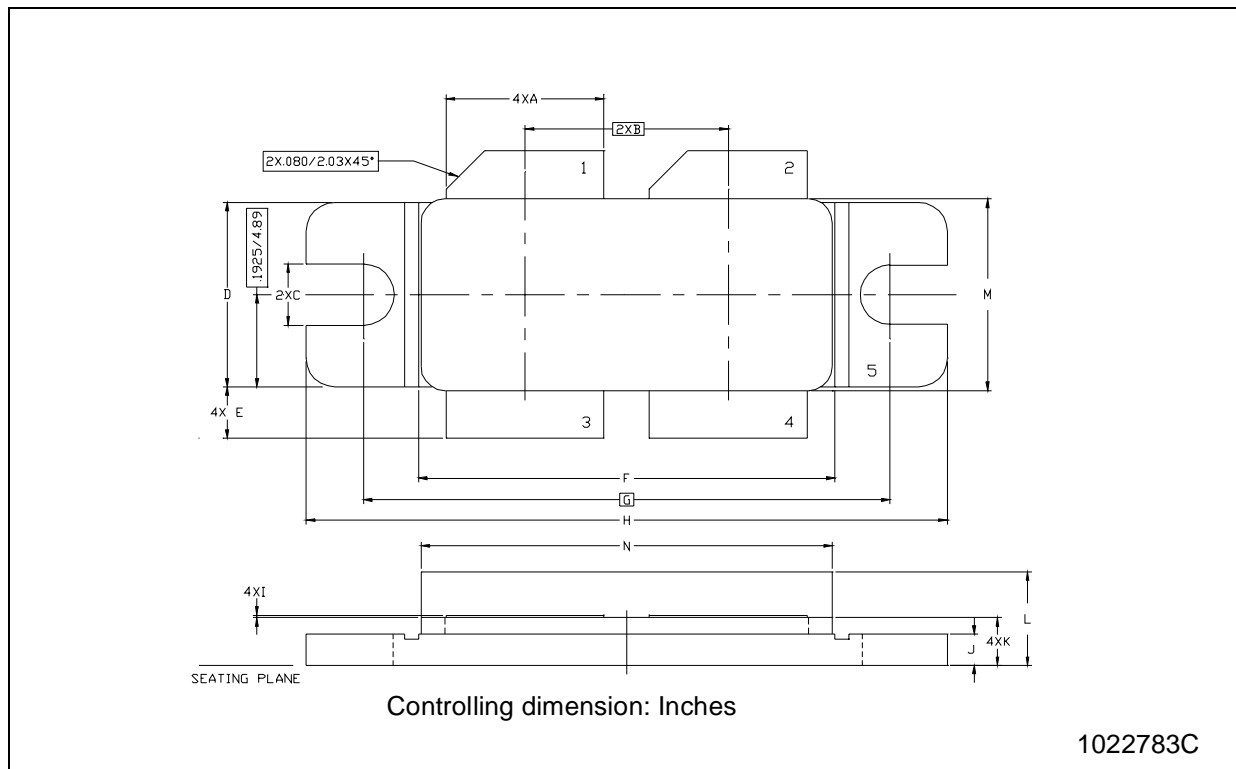


### Output Power vs. Drain Voltage



## M252 (.400 x .860 4L BAL N/HERM W/FLG) MECHANICAL DATA

DIM.	mm			Inch		
	MIN.	TYP.	MAX	MIN.	TYP.	MAX
A	8.13		8.64	.320		.340
B		10.80			.425	
C	3.00		3.30	.118		.130
D	9.65		9.91	.380		.390
E	2.16		2.92	.085		.115
F	21.97		22.23	.865		.875
G		27.94			1.100	
H	33.91		34.16	1.335		1.345
I	0.10		0.15	.004		.006
J	1.52		1.78	.060		.070
K	2.36		2.74	.093		.108
L	4.57		5.33	.180		.210
M	9.96		10.34	.392		.407
N	21.64		22.05	.852		.868



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