



# SD57060-01

## RF POWER TRANSISTORS The *LdmoST* FAMILY

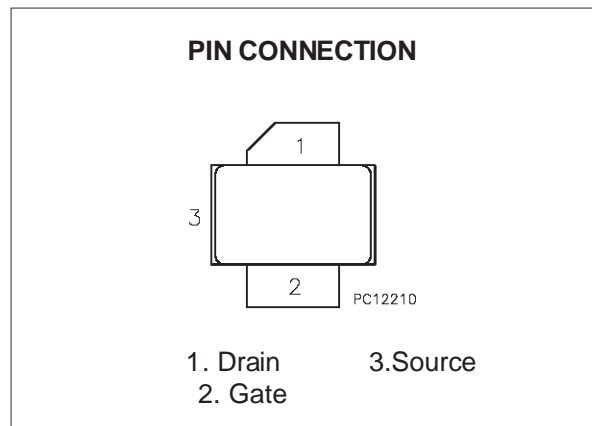
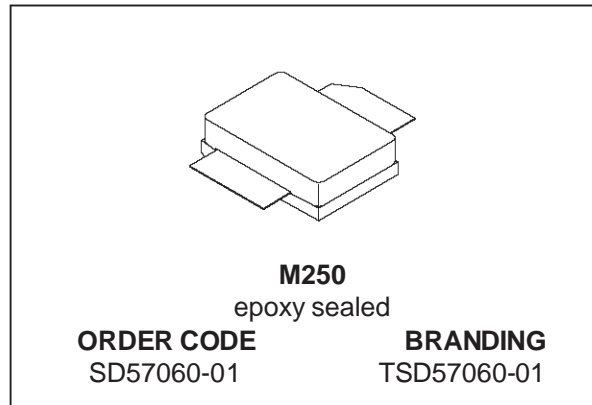
PRELIMINARY DATA

### N-CHANNEL ENHANCEMENT-MODE LATERAL MOSFETs

- EXCELLENT THERMAL STABILITY
- COMMON SOURCE CONFIGURATION
- P<sub>OUT</sub> = 60 W with 11.5 dB gain @ 945 MHz
- BeO FREE PACKAGE

### DESCRIPTION

The SD57060-01 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 SD57060-01 is designed for high gain and broadband performance operating in common source mode at 28V. It is ideal for base station applications requiring high linearity.



### ABSOLUTE MAXIMUM RATINGS (T<sub>case</sub> = 25 °C)

Symbol	Parameter	Value	Unit
V <sub>(BR)DSS</sub>	Drain Source Voltage	65	V
V <sub>GS</sub>	Gate-Source Voltage	± 20	V
I <sub>D</sub>	Drain Current	7	A
P <sub>DISS</sub>	Power Dissipation (@ T <sub>c</sub> = 70°C)	118	W
T <sub>j</sub>	Max. Operating Junction Temperature	200	°C
T <sub>STG</sub>	Storage Temperature	-65 to 150	°C

### THERMAL DATA (T<sub>case</sub> = 70 °C)

R <sub>th(j-c)</sub>	Junction-Case Thermal Resistance	1.1	°C/W
R <sub>th(c-s)*</sub>	Case-Heatsink Thermal Resistance	0.5	°C/W

\* Determined using a flat aluminum or copper heatsink with thermal compound applied (Dow Corning 340 or equivalent).

**ELECTRICAL SPECIFICATION** ( $T_{case} = 25\text{ }^{\circ}\text{C}$ )

**STATIC**

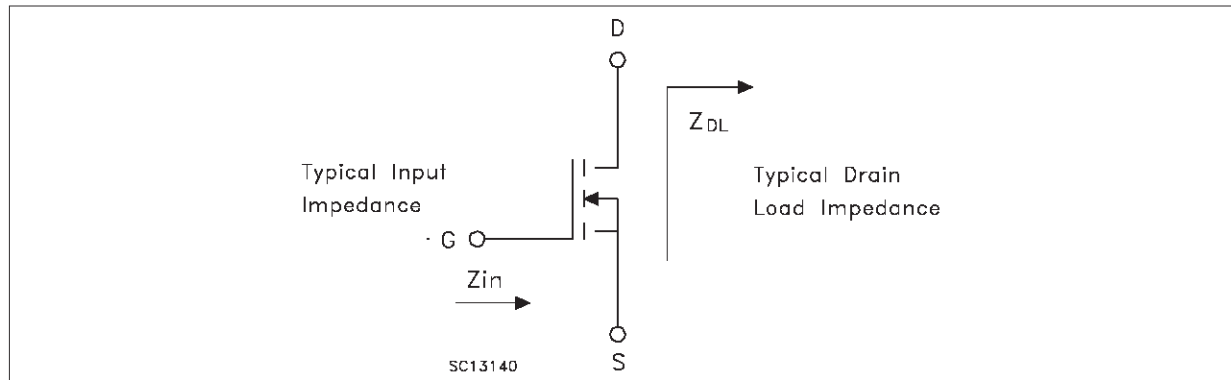
Symbol	Parameter		Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	$V_{GS} = 0V$	$I_{DS} = 1\text{ mA}$	65			V
$I_{DSS}$	$V_{GS} = 0V$	$V_{DS} = 28\text{ V}$			1	$\mu\text{A}$
$I_{GSS}$	$V_{GS} = 20V$	$V_{DS} = 0\text{ V}$			1	$\mu\text{A}$
$V_{GS(Q)}$	$V_{DS} = 28V$	$I_D = 100\text{ mA}$	2.0		5.0	V
$V_{DS(ON)}$	$V_{GS} = 10V$	$I_D = 3\text{ A}$		0.7	0.8	V
$G_{FS}$	$V_{DS} = 10V$	$I_D = 3\text{ A}$	2.5			mho
$C_{ISS}$	$V_{GS} = 0V$	$V_{DS} = 28\text{ V}$		88		pF
$C_{OSS}$	$V_{GS} = 0V$	$V_{DS} = 28\text{ V}$		44		pF
$C_{RSS}$	$V_{GS} = 0V$	$V_{DS} = 28\text{ V}$		2.8		pF

REF. 7145649B

**DYNAMIC**

Symbol	Parameter				Min.	Typ.	Max.	Unit
$P_{OUT}$	$f = 945\text{ MHz}$	$V_{DD} = 28\text{ V}$	$I_{DQ} = 100\text{ mA}$		60			W
$G_P$	$f = 945\text{ MHz}$	$V_{DD} = 28\text{ V}$	$P_{out} = 60\text{ W}$	$I_{DQ} = 100\text{ mA}$	11.5	15		dB
$\eta_D$	$f = 945\text{ MHz}$	$V_{DD} = 28\text{ V}$	$P_{out} = 60\text{ W}$	$I_{DQ} = 100\text{ mA}$	53	60		%
Load Mismatch	$f = 945\text{ MHz}$	$V_{DD} = 28\text{ V}$	$P_{out} = 60\text{ W}$	$I_{DQ} = 100\text{ mA}$	5:1			VSWR
	ALL PHASE ANGLES							

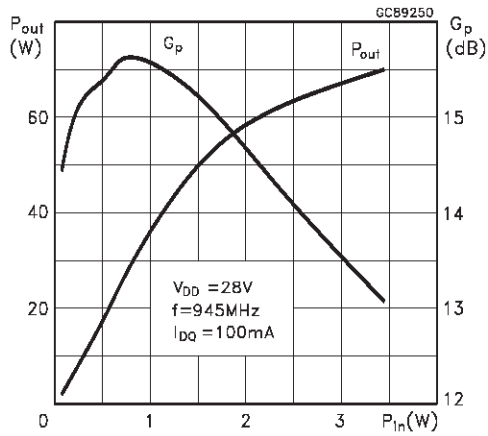
**IMPEDANCE DATA**



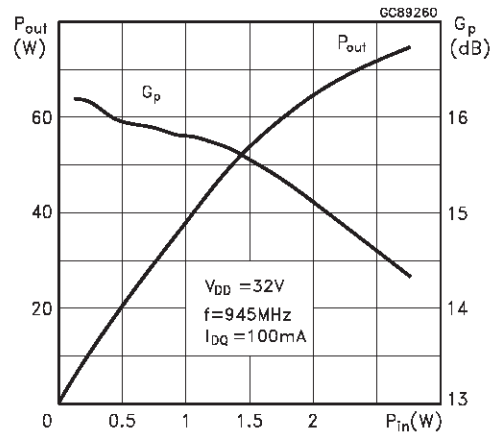
FREQ.	$Z_{IN} (\Omega)$	$Z_{DL} (\Omega)$
925 MHz	$0.8 - j 0.095$	$1.5 + j 0.48$
945 MHz	$0.7 - j 0.65$	$1.6 + j 0.25$
960 MHz	$0.7 - j 0.1$	$1.7 + j 0.130$

TYPICAL PERFORMANCE

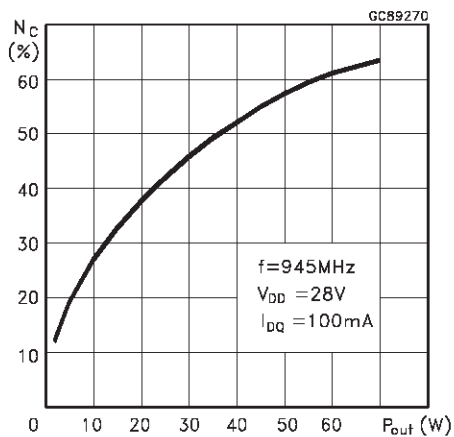
Output Power and Power Gain vs Input Power



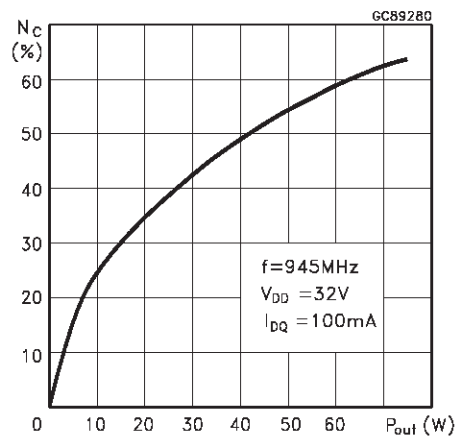
Output Power and Power Gain vs Input Power



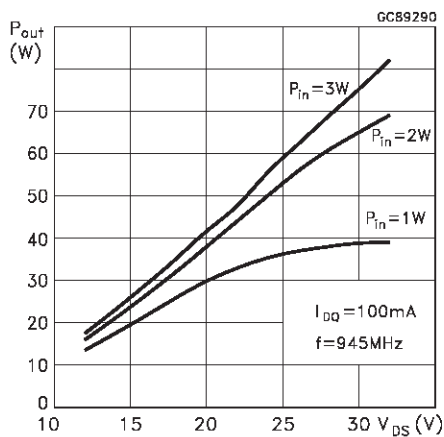
Efficiency vs Output Power



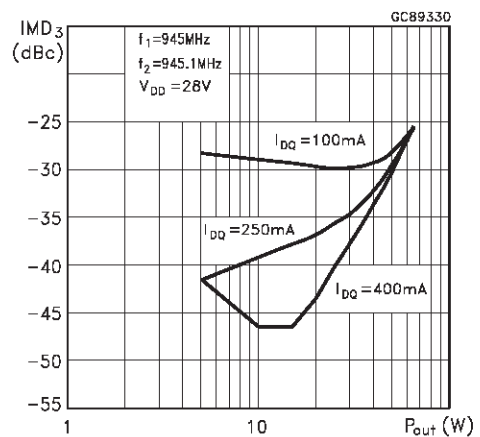
Efficiency vs Output Power



Output Power vs Drain-Source Voltage

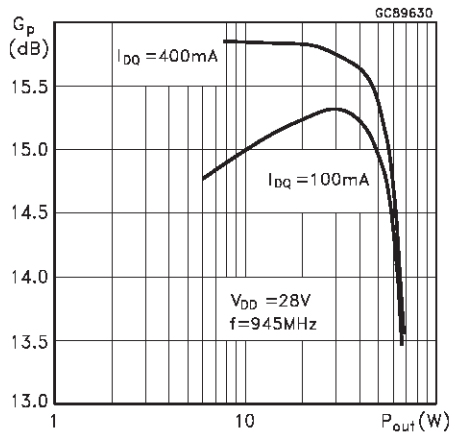


Intermodulation Distortion vs Output Power

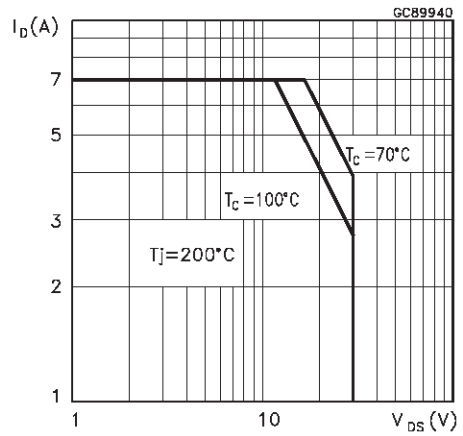


TYPICAL PERFORMANCE

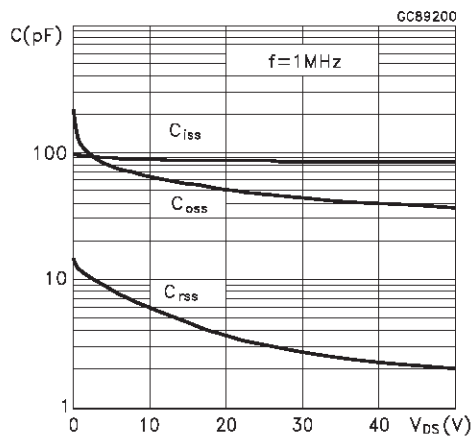
Power Gain vs Output Power



Safe Operating Area



Capacitance vs Drain-Source Voltage



## COMMON SOURCE S-PARAMETERS

(V<sub>DS</sub> = 13.5 V, I<sub>DS</sub> = 2 A)

FREQ( MHz)	s11 MAG	s11 ang	s21 MAG	s21 ang	s12 MAG	s12 ang	s22 MAG	s22 ang
50	0.896	-168.86	15.679	85.012	0.0116	-5.1128	0.796	-170.27
60	0.896	-169.3	14.859	84.592	0.0116	-5.4369	0.796	-170.49
70	0.896	-169.76	14.004	84.14	0.0116	-5.7912	0.797	-170.7
80	0.896	-170.23	13.122	83.644	0.0115	-6.0658	0.797	-170.9
90	0.897	-170.71	12.213	83.074	0.0115	-6.3789	0.798	-171.1
100	0.897	-171.19	11.285	82.404	0.0114	-6.8198	0.799	-171.29
150	0.9	-173.39	6.9575	76.841	0.0111	-9.6817	0.808	-171.96
200	0.905	-174.29	4.751	71.951	0.0103	-11.87	0.821	-171.79
250	0.912	-174.64	3.637	68.471	0.0097	-12.957	0.836	-171.36
300	0.92	-174.9	2.889	64.839	0.0089	-13.493	0.851	-171.03
350	0.927	-175.08	2.428	62.538	0.0083	-11.937	0.866	-170.76
400	0.934	-175.3	2.077	58.748	0.0077	-11.228	0.881	-170.6
450	0.941	-175.5	1.802	56.081	0.0071	-8.7753	0.894	-170.49
500	0.947	-175.73	1.592	51.84	0.0066	-7.5009	0.907	-170.47
550	0.952	-176.02	1.379	48.632	0.0059	-4.8834	0.917	-170.55
600	0.956	-176.29	1.221	45.777	0.0053	0.12909	0.927	-170.67
650	0.96	-176.6	1.049	42.778	0.0048	5.0249	0.936	-170.82
700	0.962	-176.9	0.924	42.212	0.0043	13.591	0.943	-170.94
750	0.965	-177.22	0.814	40.376	0.0039	22.729	0.95	-171.05
800	0.968	-177.51	0.723	41.348	0.0036	37.954	0.956	-171.14
850	0.97	-177.83	0.662	40.788	0.0037	51.305	0.961	-171.16
900	0.972	-178.19	0.6	41.719	0.0041	63.188	0.966	-171.24
950	0.974	-178.56	0.566	41.469	0.0047	73.463	0.971	-171.24
1000	0.975	-178.96	0.523	41.747	0.0055	80.707	0.974	-171.25
1050	0.976	-179.28	0.504	41.439	0.0064	88.27	0.977	-171.26
1100	0.978	-179.62	0.477	40.692	0.0074	92.504	0.979	-171.36
1150	0.979	-179.85	0.466	39.239	0.0084	96.743	0.981	-171.43
1200	0.981	179.9	0.444	36.775	0.0097	98.282	0.982	-171.5
1250	0.982	179.68	0.431	34.788	0.011	99.121	0.983	-171.58
1300	0.983	179.52	0.408	31.862	0.0125	98.773	0.983	-171.71
1350	0.984	179.35	0.395	30.219	0.0136	97.973	0.983	-171.86
1400	0.985	179.24	0.382	26.465	0.0148	97.464	0.984	-171.94
1450	0.987	179.13	0.365	23.869	0.0157	95.39	0.984	-171.98
1500	0.988	179.09	0.351	21.267	0.0165	93.871	0.985	-171.98

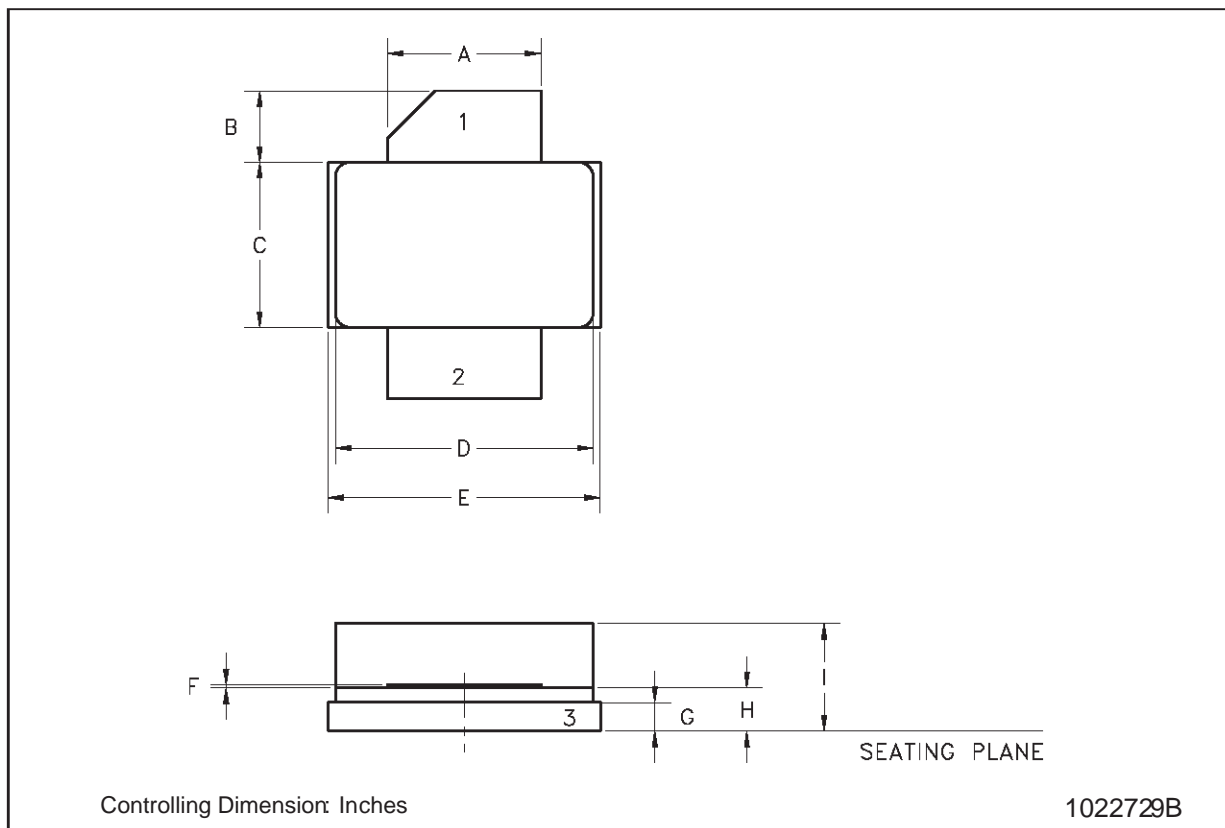
## COMMON SOURCE S-PARAMETERS

(V<sub>DS</sub> = 28 V, I<sub>DS</sub> = 2 A)

FREQ( MHz)	s11 MAG	s11 ang	s21 MAG	s21 ang	s12 MAG	s12 ang	s22 MAG	s22 ang
50	0.857	-159.69	22.757	85.934	0.0114	-3.8342	0.67	-161.72
60	0.86	-160.69	21.547	85.328	0.0113	-4.4852	0.672	-162.07
70	0.862	-161.73	20.287	84.672	0.0112	-5.1512	0.674	-162.41
80	0.865	-162.8	18.987	83.933	0.0111	-5.8379	0.677	-162.74
90	0.869	-163.89	17.65	83.083	0.011	-6.5533	0.679	-163.07
100	0.872	-164.98	16.286	82.083	0.011	-7.4226	0.683	-163.39
150	0.891	-169.66	9.9447	74.03	0.0103	-12.13	0.708	-164.66
200	0.905	-171.43	6.719	67.256	0.0094	-15.548	0.74	-164.87
250	0.915	-172.29	5.074	62.268	0.0086	-17.236	0.774	-164.99
300	0.926	-172.84	3.978	57.533	0.0077	-18.625	0.806	-165.35
350	0.935	-173.34	3.297	54.035	0.0069	-17.313	0.834	-165.82
400	0.943	-173.79	2.775	49.488	0.0061	-16.81	0.86	-166.35
450	0.951	-174.24	2.376	46.121	0.0054	-13.006	0.881	-166.85
500	0.957	-174.67	2.061	41.541	0.0048	-9.175	0.898	-167.35
550	0.962	-175.11	1.766	38.23	0.0041	-2.5323	0.913	-167.83
600	0.966	-175.53	1.546	35.173	0.0035	-7.641	0.925	-168.25
650	0.969	-175.95	1.32	32.548	0.0031	19.501	0.937	-168.57
700	0.972	-176.34	1.162	31.674	0.0031	34.423	0.946	-168.81
750	0.974	-176.75	1.021	29.983	0.0032	48.345	0.954	-168.93
800	0.976	-177.15	0.91	30.341	0.0035	62.927	0.96	-168.98
850	0.977	-177.57	0.826	29.318	0.004	74.982	0.967	-168.95
900	0.978	-177.98	0.749	29.508	0.0047	81.962	0.973	-168.88
950	0.979	-178.41	0.696	28.477	0.0054	87.332	0.978	-168.77
1000	0.979	-178.85	0.639	27.949	0.0063	90.913	0.982	-168.72
1050	0.98	-179.24	0.601	26.768	0.0072	95.707	0.984	-168.75
1100	0.981	-179.61	0.561	25.598	0.0082	98.95	0.985	-168.87
1150	0.981	-179.95	0.533	23.746	0.0094	101.25	0.986	-169.13
1200	0.982	179.72	0.498	21.331	0.011	102.03	0.985	-169.64
1250	0.983	179.44	0.472	19.005	0.012	102.21	0.981	-170.42
1300	0.984	179.23	0.44	16.272	0.0131	101.78	0.976	-171.5
1350	0.985	179.02	0.417	14.424	0.0143	100.61	0.969	-172.89
1400	0.986	178.85	0.394	11.161	0.0156	99.505	0.96	-174.72
1450	0.986	178.7	0.372	8.789	0.0163	97.699	0.949	-176.87
1500	0.986	178.6	0.354	6.5533	0.0168	96.68	0.94	-178.58

**M250 (.230 x .360 WIDE 2/L N/HERM PILL) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	5.21		5.71	0.205		0.225
B	2.16		2.92	0.085		0.115
C	5.59		6.09	0.220		0.240
D	8.89		9.40	0.350		0.370
E	9.40		9.91	0.370		0.390
F	0.11		0.15	0.004		0.006
G	0.89		1.14	0.035		0.045
H	1.45		1.70	0.057		0.067
I	2.67		3.94	0.105		0.155



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