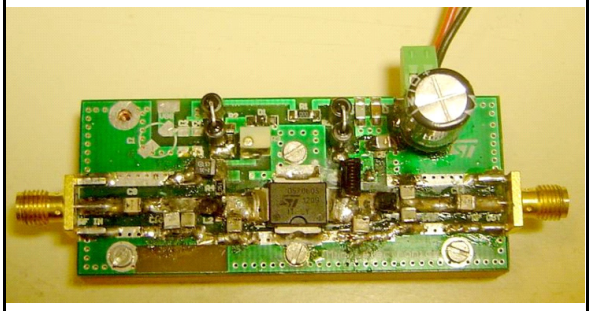
DB-57060S-526

RF POWER amplifier using 1 x PD57060S N-channel enhancement-mode lateral MOSFETs

General Feature

- Excellent thermal stability
- Frequency: 486 - 526MHz
- Supply voltage: 26V
- Output power: 20W
- Operation: class AB
- IMD3 (2 tones test): < -36 dBc @ 20W avg
- Load mismatch: 20:1
- Beo free amplifier



Mechanical specification:
L = 70 mm, W = 30 mm

Description

The DB-57060S-526 is a common source N-Channel Enhancement-Mode Lateral Field Effect RF power amplifer designed for UHF repeater applications

Order code

- DB-57060S-526

Contents

1 Electrical data

1.1 Maximum ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage	32	V
I_D	Drain Current	2.5	A
T_{CASE}	Operating Case Temperature	-20 to +85	°C
T_A	Max. Ambient Temperature	+55	°C

2 Electrical characteristics

T_A = +25 °C, V_{DD} = 26V, I_{dq} = 200mA

Table 2. Electrical specification

Symbol	Test conditions	Min	Typ	Max	Unit
Freq	Frequency Range	486		526	MHz
P_{OUT}			20		W
Gain			15.5 ±0.6		dB
Efficiency	@ P_{OUT} = 20W		34 - 39		%
IMD3	2 tones : 1MHz spacing - 20W avg		-36		dBc
VSWR	Load Mismatch all phases @ P_{OUT} = 20W			20:1	

3 Typical performance

Figure 1. Gain vs frequency

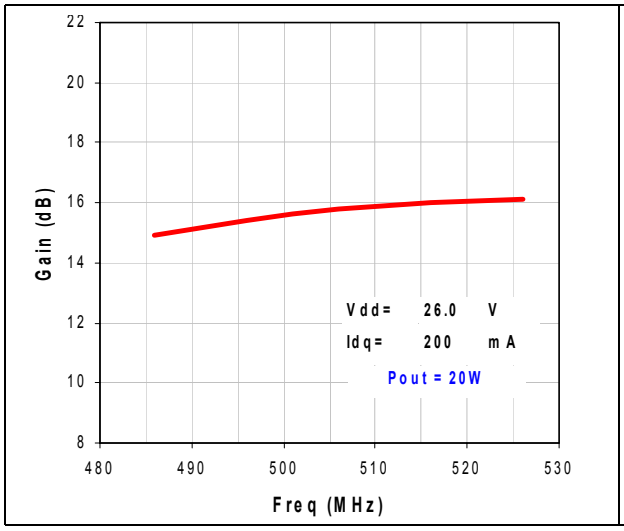


Figure 2. Efficiency vs frequency

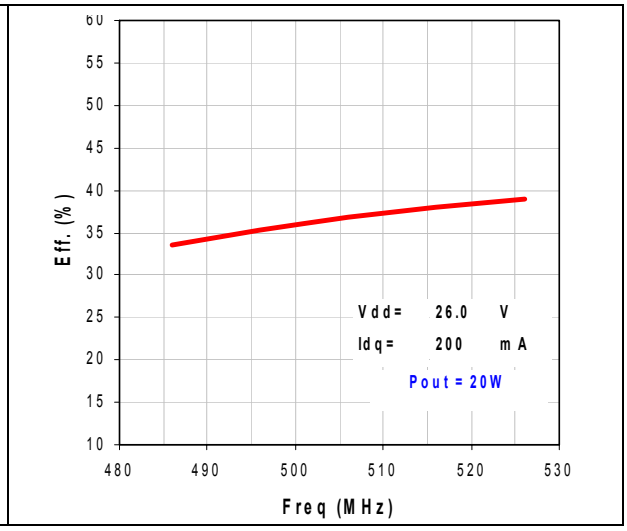
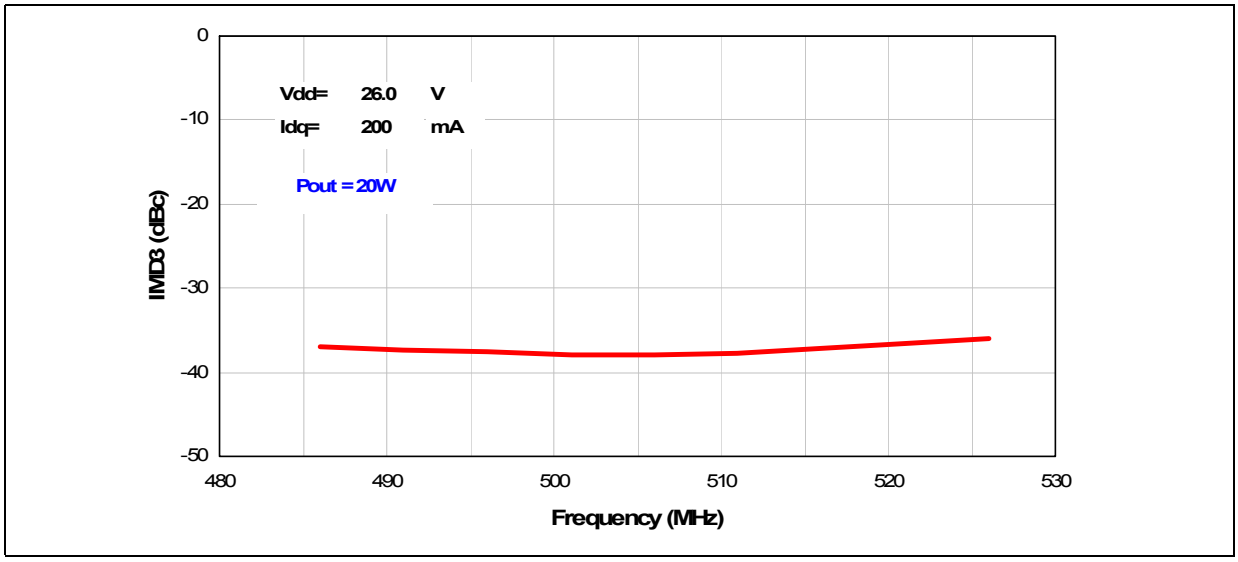


Figure 3. IMD3 vs frequency



4 Test circuit

Table 3. Test circuit schematic

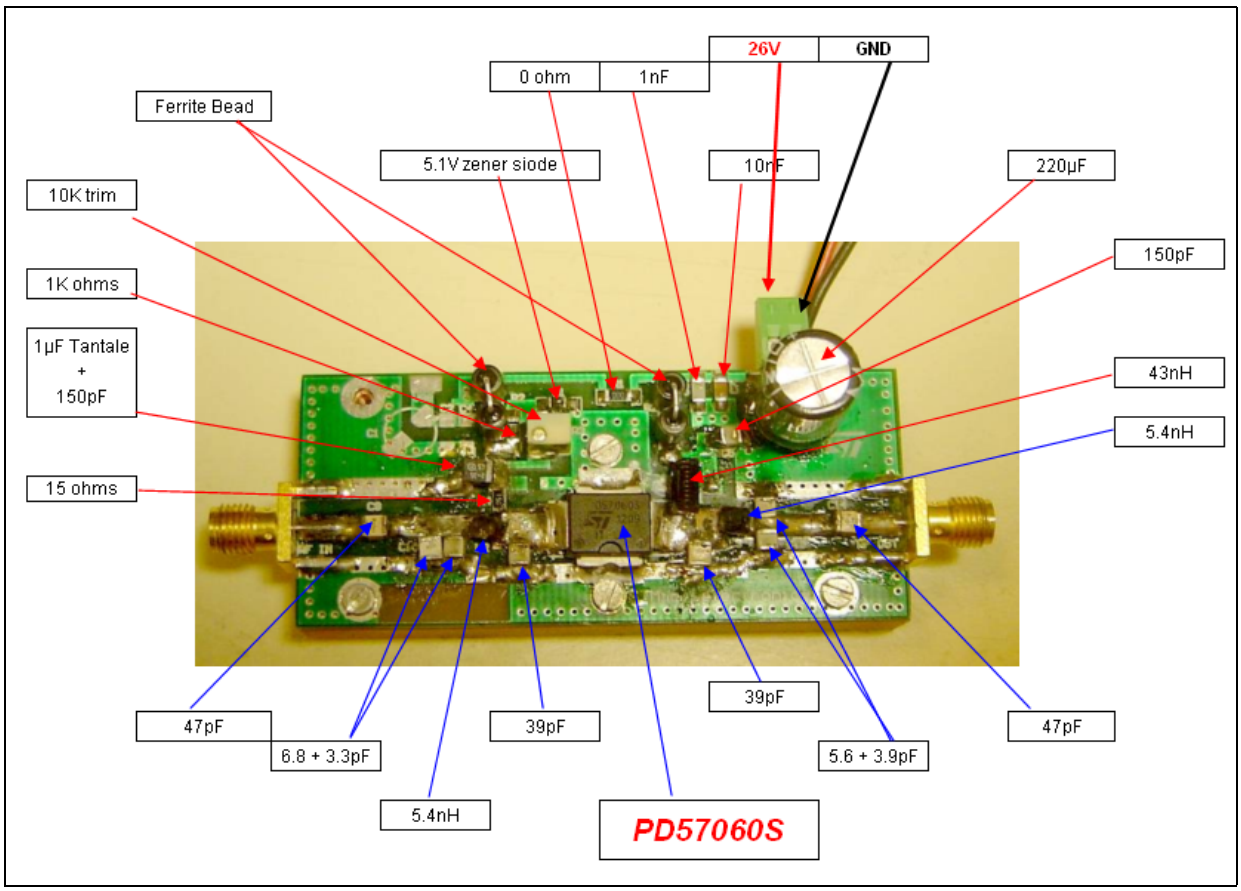
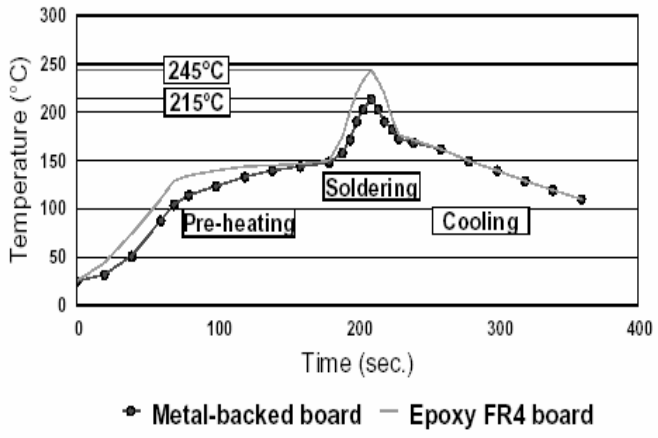


Table 4. Recommended heat profile / reflow soldering



5 Circuit layout

Table 5. Circuit layout

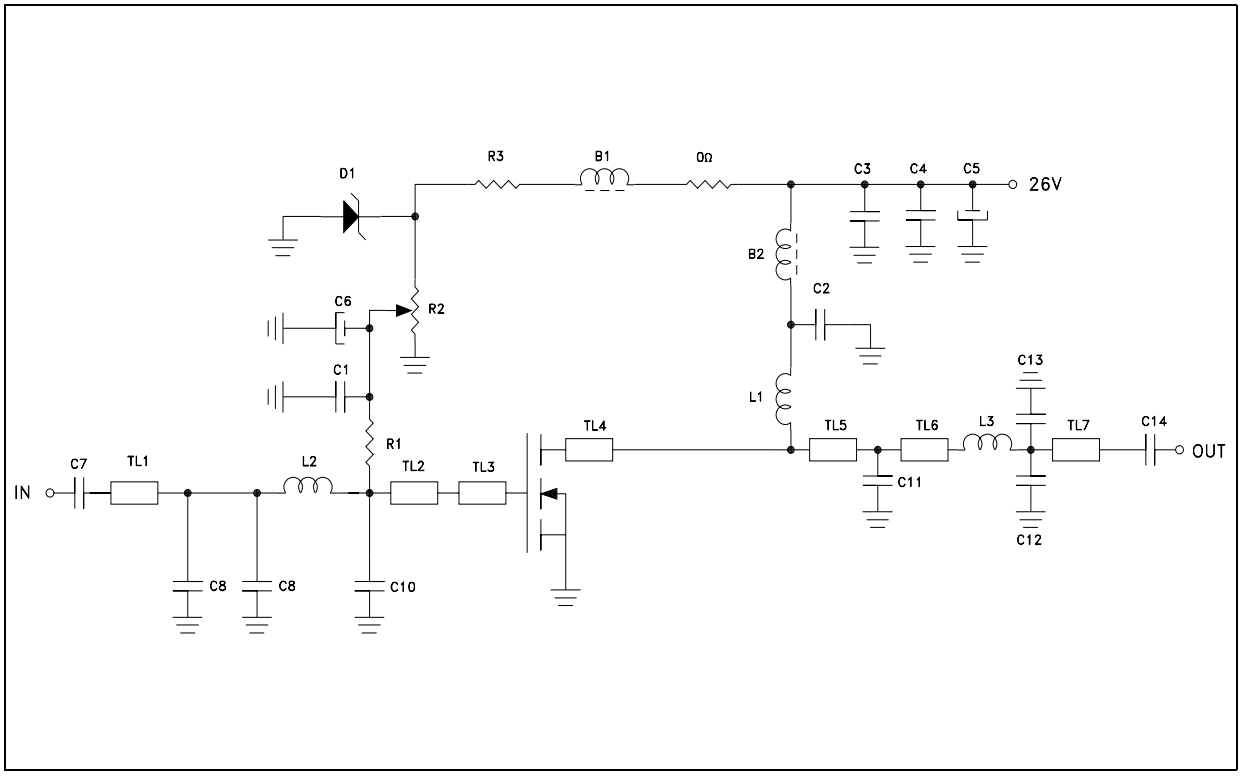


Table 6. Component part list

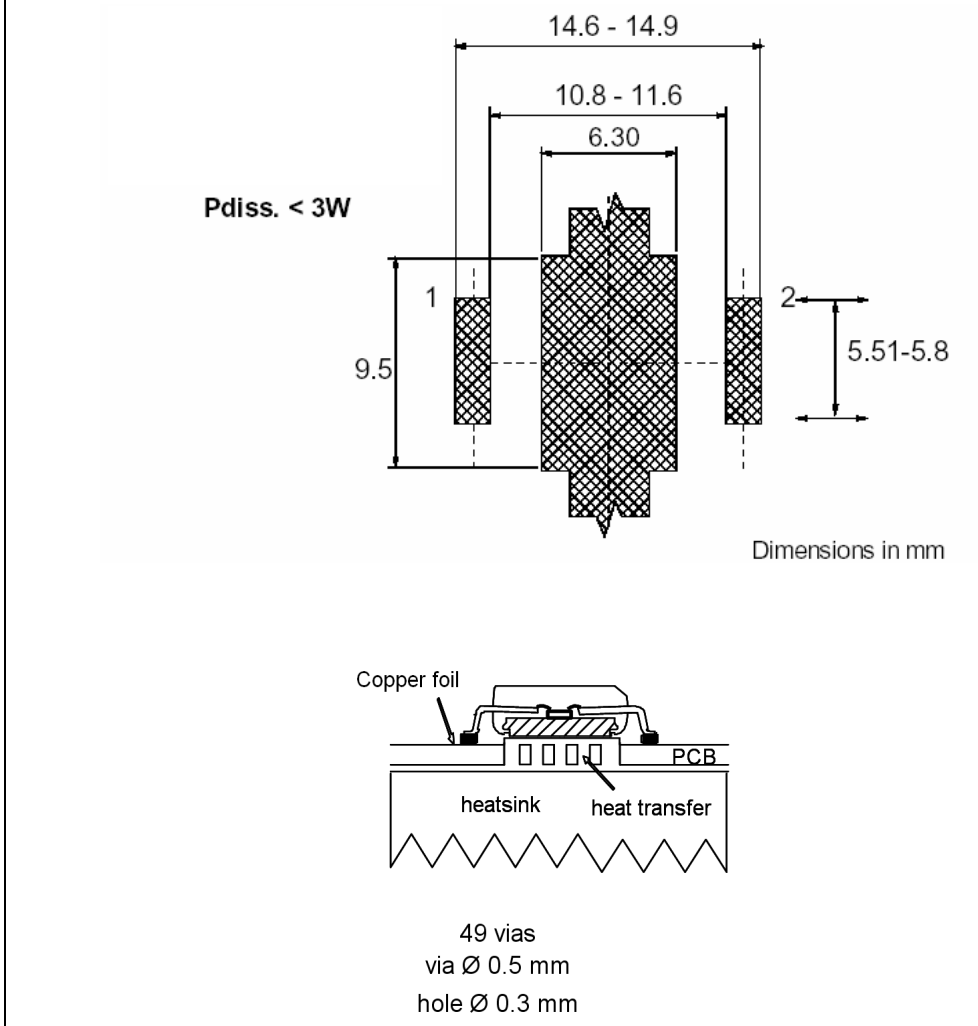
Part type	Component ID	Description	Value	Case size	Manufacturer	Part Code
CAP	C1	Capacitor	150pF	1206	Murata	GRM42-6C0G151J50
CAP	C2	Capacitor	150pF	1206	Murata	GRM42-6C0G151J50
CAP	C3	Capacitor	1nF	1206	Murata	GRM42-6C0G102J50
CAP	C4	Capacitor	10nF	1206	Murata	GRM42-6X7R104K50
Electrolytic CAP	C5	Capacitor	220µF			
Tantale CAP	C6	Capacitor	1µF			
CAP	C7	Capacitor	47pF	100B	ATC	470
CAP	C8	Capacitor	3.3pF	100B	ATC	3R3
CAP	C9	Capacitor	6.8pF	100B	ATC	6R8

Table 6. Component part list

Part type	Component ID	Description	Value	Case size	Manufacturer	Part Code
CAP	C10	Capacitor	39pF	100B	ATC	390
CAP	C11	Capacitor	39pF	100B	ATC	390
CAP	C12	Capacitor	5.6pF	100B	ATC	5R6
CAP	C13	Capacitor	3.9pF	100B	ATC	3R9
CAP	C14	Capacitor	47pF	100B	ATC	470
TL	TL1, TL7	Transmission Line	W = 2.87 mm L = 6 mm			
TL	TL2	Transmission Line	W = 4.9 mm L = 5 mm			
TL	TL3, TL4	Transmission Line	W = 6 mm L = 3 mm			
TL	TL5	Transmission Line	W = 4.9 mm L = 2.5 mm			
TL	TL6	Transmission Line	W = 4.9 mm L = 2.5 mm			
Ferrite Bead	B1	Ferrite Bead			PANASONIC	EXCELDRC35C
Ferrite Bead	B2	Ferrite Bead			PANASONIC	EXCELDRC35C
Inductor	L1	Inductor	43nH		Coilcraft Mini Spring	B10TJ
Inductor	L2	Inductor	5nH		Coilcraft Mini Spring	A02TJ
Inductor	L3	Inductor	5nH		Coilcraft Mini Spring	A02TJ
Transistor	PD57060S	LDMOS			STMicroelectronics	PD57060S
Resistor	R1	Resistor	15	1206	TYCO ELECTRONICS	01623440-1
POT	R2	Potentiometer	10K		BOURNS ELECTRONICS	3214W-1-103E
Resistor	R3	Resistor	1KΩ	1206	TYCO ELECTRONICS	01623440-1
SMA-CONN	RF in	SMA-CONN			Johnson	142-0701-801
SMA-CONN	RF out	SMA-CONN			Johnson	142-0701-801
ZENER	D1	Zener Diode	5.1V	SOD110	PHILIPS	BZX284C5V1
BOARD	FR-4 THk=0.060" 2OZ Cu Both Sides					

6 Mounting indications

Figure 4. PowerSO-10 Mounting indications



7 Package mechanical data

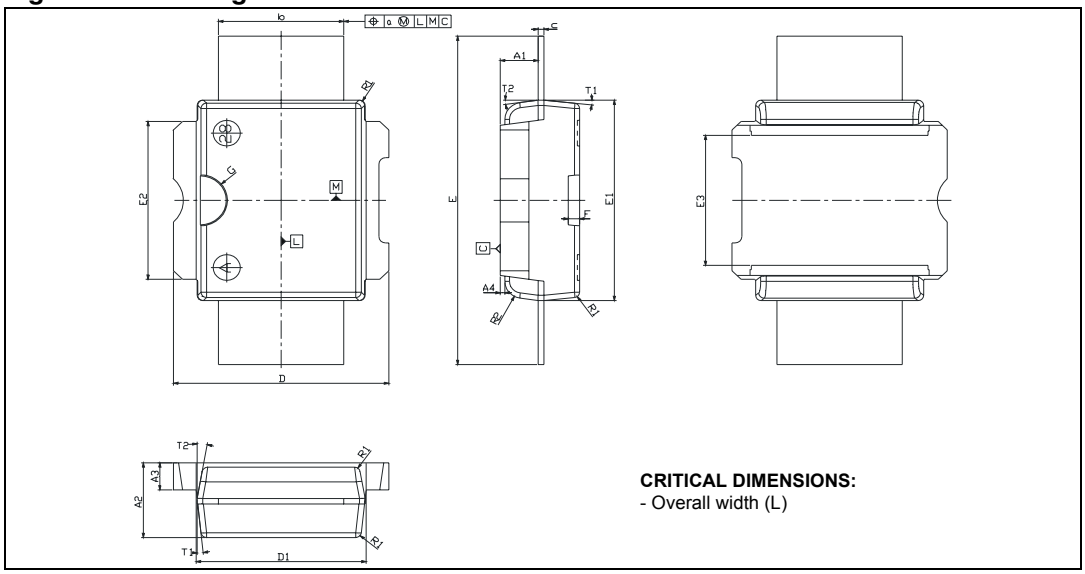
In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

Table 7. PowerSO-10RF Straight Lead Mechanical data

Dim.	mm.			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A1	1.62	1.67	1.72	0.064	0.065	0.068
A2	3.4	3.5	3.6	0.134	0.137	0.142
A3	1.2	1.3	1.4	0.046	0.05	0.054
A4	0.15	0.2	0.25	0.005	0.007	0.009
a		0.2			0.007	
b	5.4	5.53	5.65	0.212	0.217	0.221
c	0.23	0.27	0.32	0.008	0.01	0.012
D	9.4	9.5	9.6	0.370	0.374	0.377
D1	7.4	7.5	7.6	0.290	0.295	0.298
E	15.15	15.4	15.65	0.595	0.606	0.615
E1	9.3	9.4	9.5	0.365	0.37	0.375
E2	7.3	7.4	7.5	0.286	0.292	0.294
E3	5.9	6.1	6.3	0.231	0.24	0.247
F		0.5			0.019	
G		1.2			0.047	
R1			0.25			0.01
R2		0.8			0.031	
T1		6 deg			6 deg	
T2		10 deg			10 deg	

Note: Resin protrusions not included (max value: 0.15 mm per side)

Figure 5. Package dimensions



8 Revision history

Table 8. Revision history

Date	Revision	Changes
19-Jul-2006	1	Initial release

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