

RoHS Compliant

FMM5052ZEE1

0.8-2.7GHz Power Amplifier MMIC

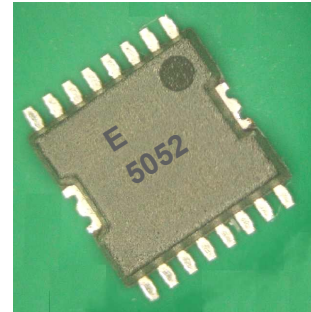
FEATURES

- Wide Frequency Band : 0.8 to 2.7GHz
- Medium Power : P1dB=26dBm(Typ.) @ f=0.8-2.7GHz
- High Linear Gain : GL=19dB(Typ.) @ f=0.8-2.7GHz
- Impedance Matched Zin/Zout=50Ω
- Wide Operating Temperature Range
- Small Size : SSOP-16 Plastic Package for SMT Applications

DESCRIPTION

The FMM5052ZE is a MMIC power amplifier that includes a two-stage amplifier, internally matched, for broadband applications in the 0.8 to 2.7GHz frequency range. This product is uniquely suited for use in cellular, W-CDMA/PCS, MMDS, and WLL base station amplifiers as it offers high gain, long term reliability and ease of use.

Fujitsu's stringent Quality Assurance Program assures the highest reliability and consistent performance.



ABSOLUTE MAXIMUM RATINGS (Case Temperature Tc=25°C)

| Item | Symbol | Rating | Unit |
|---------------------|--------|-------------|------|
| DC Input Voltage | VDD1,2 | 10 | V |
| DC Input Voltage | VGG1,2 | -8 | V |
| Input Power | Pin | 15 | dBm |
| Storage Temperature | Tstg | -55 to +125 | °C |

RECOMMENDED OPERATING CONDITION(Case Temperature Tc=25°C)

| Item | Symbol | Condition | Unit |
|-----------------------------|--------|------------|------|
| DC Input Voltage at Tc=25°C | VDD1,2 | ≤8 | V |
| Gate Voltage at Tc=25°C | VGG1,2 | -3 | V |
| Operating Case Temperature | Top | -40 to +85 | °C |

ELECTRICAL CHARACTERISTICS (Case Temperature Tc=25°C)

| Item | Symbol | Test Conditions | Limit | | | Unit |
|----------------------------|--------|--|---------|-------|------|------|
| | | | Min. | Typ. | Max. | |
| Frequency Range | f | | 0.8-2.7 | | | GHz |
| Output Power at 1dB G.C.P. | P1dB | VDD1,2=8.0V VGG1,2=-3.0V Pin=-5dBm | 25.0 | 26.0 | - | dBm |
| Linear Gain | GL | | 17.0 | 19.0 | - | dB |
| Gain Flatness | ΔG | | - | 2.0 | 3.0 | dB |
| Input VSWR | VSWRi | | - | 1.6:1 | - | dB |
| DC Input Current | IDD | VDD1,2=8.0V VGG1,2=-3.0V | - | 220 | 300 | mA |
| DC Input Current | IGG | | - | 2.0 | 4.0 | mA |

CASE STYLE: ZE

G.C.P.:Gain Compression Point

| | | |
|-----|----------|------------|
| ESD | Class II | 500~1999 V |
|-----|----------|------------|

Note : Based on EIAJ ED-4701 C-111A(C=100pF, R=1.5kΩ)

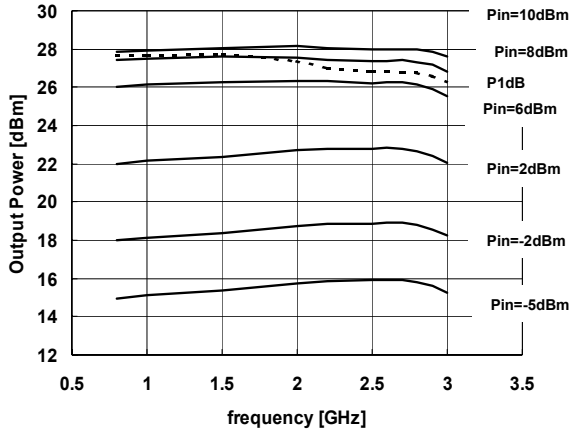
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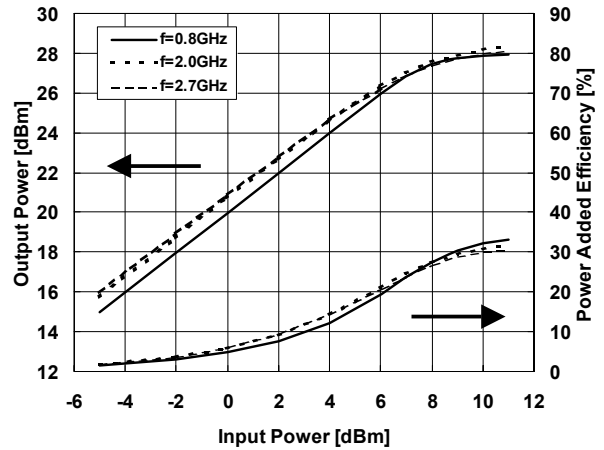
OUTPUT POWER vs. FREQUENCY

VDD1,2=8V, VGG1,2=-3V



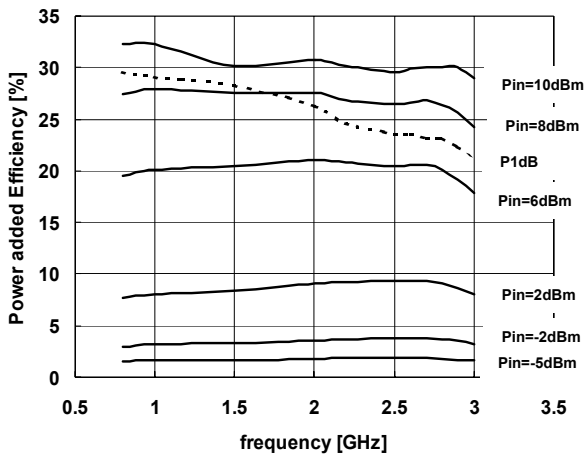
OUTPUT POWER , POWER ADDED EFFICIENCY vs. INPUT POWER

VDD1,2=8V, VGG1,2=-3V



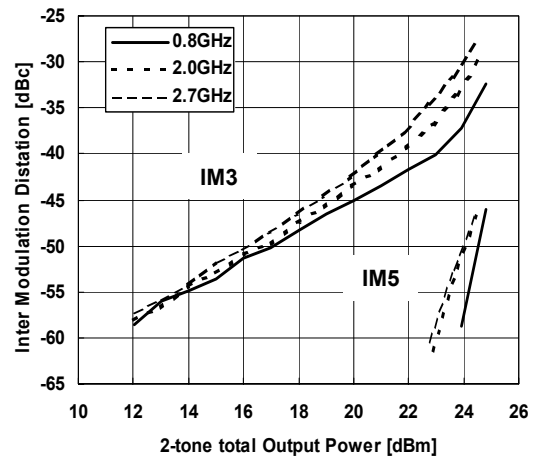
POWER ADDED EFFICIENCY vs FREQUENCY

VDD1,2=8V, VGG1,2=-3V



IMD vs OUTPUT POWER

VDD1,2=8.0V, VGG1,2=-3.0V



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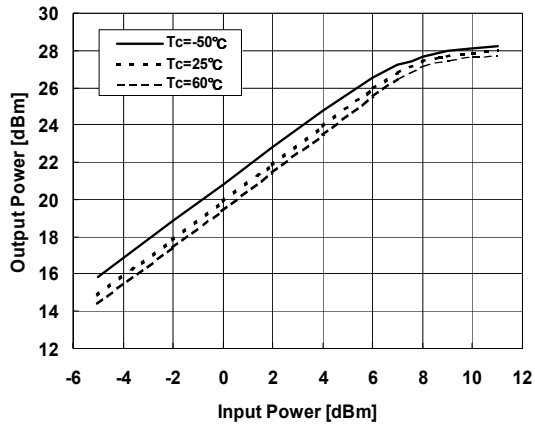
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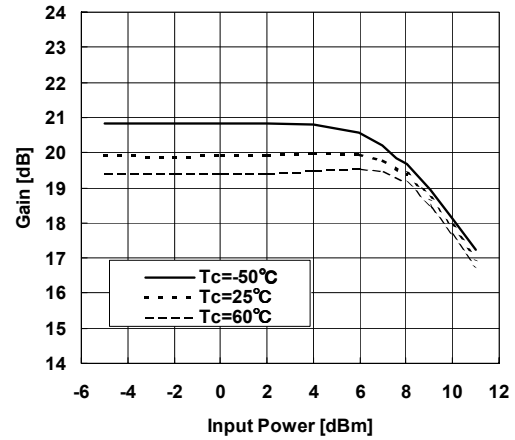
OUTPUT POWER vs INPUT POWER

VDD1,2=8.0V, VGG1,2=-3.0V, f=0.8GHz



Gain vs INPUT POWER

VDD1,2=8.0V, VGG1,2=-3.0V, f=0.8GHz



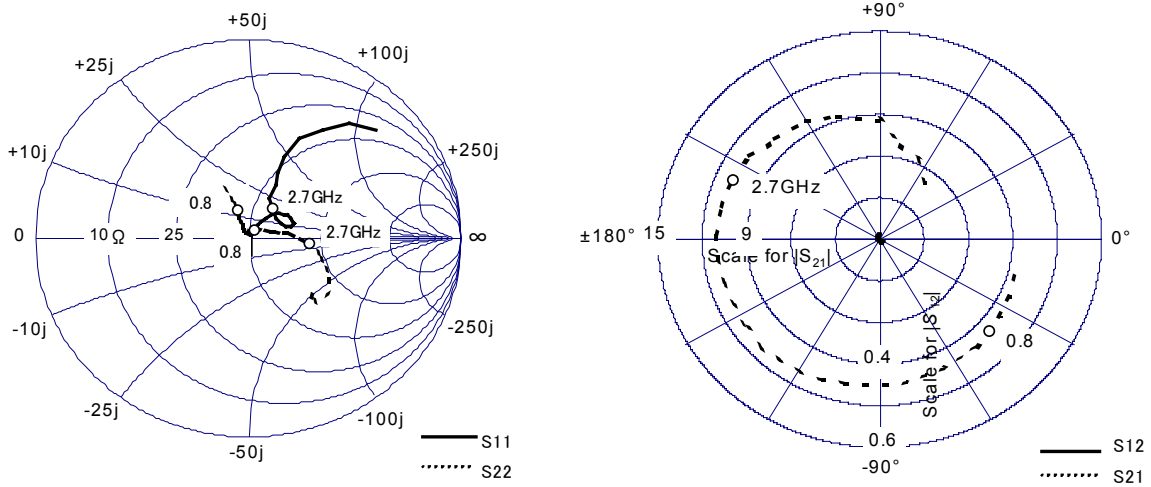
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S-PARAMETER



VDD1,2=8.0V , VGG1,2=-3.0V

| Freq [GHz] | S11 | | S21 | | S12 | | S22 | |
|---------------|------|--------|-------|---------|--------|---------|------|--------|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 0.5 | 0.09 | -83.40 | 9.54 | -16.67 | 0.0140 | -14.87 | 0.27 | 114.80 |
| 0.6 | 0.04 | -75.59 | 9.71 | -25.64 | 0.0140 | -16.78 | 0.22 | 112.48 |
| 0.7 | 0.02 | 22.13 | 9.85 | -33.81 | 0.0130 | -22.86 | 0.18 | 111.20 |
| 0.8 | 0.05 | 54.37 | 9.94 | -41.78 | 0.0130 | -23.96 | 0.15 | 110.72 |
| 0.9 | 0.08 | 56.00 | 10.06 | -49.59 | 0.0130 | -29.19 | 0.12 | 111.24 |
| 1 | 0.11 | 55.32 | 10.14 | -57.01 | 0.0120 | -29.44 | 0.10 | 112.70 |
| 1.1 | 0.13 | 51.90 | 10.25 | -64.58 | 0.0120 | -32.76 | 0.08 | 114.24 |
| 1.2 | 0.16 | 48.37 | 10.33 | -71.99 | 0.0120 | -35.51 | 0.07 | 113.84 |
| 1.3 | 0.17 | 44.64 | 10.42 | -79.73 | 0.0110 | -37.69 | 0.06 | 117.50 |
| 1.4 | 0.19 | 40.33 | 10.50 | -87.30 | 0.0120 | -41.63 | 0.05 | 115.98 |
| 1.5 | 0.20 | 35.96 | 10.60 | -94.92 | 0.0110 | -56.17 | 0.04 | 115.44 |
| 1.6 | 0.22 | 31.84 | 10.72 | -102.71 | 0.0110 | -51.96 | 0.03 | 111.42 |
| 1.7 | 0.23 | 27.25 | 10.82 | -110.93 | 0.0100 | -61.28 | 0.03 | 102.63 |
| 1.8 | 0.23 | 22.71 | 10.88 | -119.04 | 0.0100 | -65.08 | 0.03 | 85.55 |
| 1.9 | 0.23 | 19.64 | 10.96 | -127.58 | 0.0090 | -66.46 | 0.04 | 69.41 |
| 2 | 0.22 | 16.92 | 11.05 | -136.19 | 0.0090 | -79.37 | 0.06 | 50.01 |
| 2.1 | 0.21 | 15.57 | 11.06 | -145.59 | 0.01 | -91.28 | 0.09 | 29.55 |
| 2.2 | 0.21 | 17.76 | 10.94 | -154.04 | 0.01 | -87.90 | 0.11 | 17.53 |
| 2.3 | 0.20 | 17.73 | 10.98 | -162.86 | 0.01 | -102.36 | 0.13 | 13.98 |
| 2.4 | 0.18 | 18.50 | 11.10 | -172.45 | 0.01 | -124.63 | 0.17 | 9.56 |
| 2.5 | 0.17 | 25.78 | 11.07 | 178.61 | 0.00 | -125.33 | 0.20 | 6.37 |
| 2.6 | 0.16 | 38.12 | 10.99 | 167.99 | 0.00 | -145.38 | 0.25 | 0.10 |
| 2.7 | 0.18 | 52.95 | 10.74 | 156.82 | 0.01 | -168.98 | 0.29 | -5.46 |
| 2.8 | 0.23 | 63.34 | 10.62 | 145.64 | 0.01 | 174.58 | 0.33 | -11.41 |
| 2.9 | 0.30 | 64.74 | 10.09 | 134.17 | 0.01 | 149.19 | 0.36 | -18.29 |
| 3 | 0.35 | 67.46 | 9.95 | 120.23 | 0.01 | 157.12 | 0.40 | -22.69 |
| 3.1 | 0.45 | 67.53 | 9.24 | 108.35 | 0.01 | 136.19 | 0.43 | -28.46 |
| 3.2 | 0.56 | 64.50 | 8.54 | 90.73 | 0.01 | 126.36 | 0.46 | -35.30 |
| 3.3 | 0.65 | 57.56 | 6.99 | 78.04 | 0.01 | 126.38 | 0.46 | -46.55 |
| 3.4 | 0.75 | 50.75 | 6.27 | 65.43 | 0.01 | 112.20 | 0.41 | -43.33 |
| 3.5 | 0.81 | 42.56 | 5.06 | 53.06 | 0.01 | 97.11 | 0.44 | -48.36 |

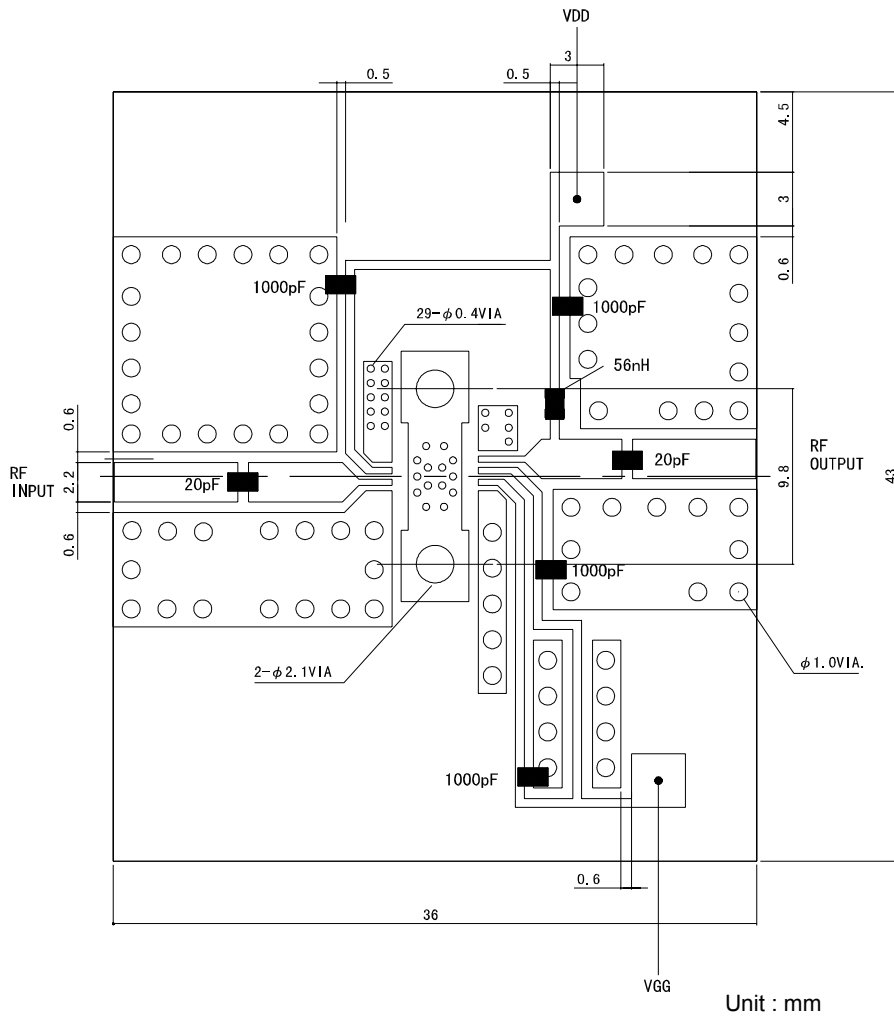
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■ BOARD LAYOUT



Dielectric Constant $\epsilon_r = 2.5$

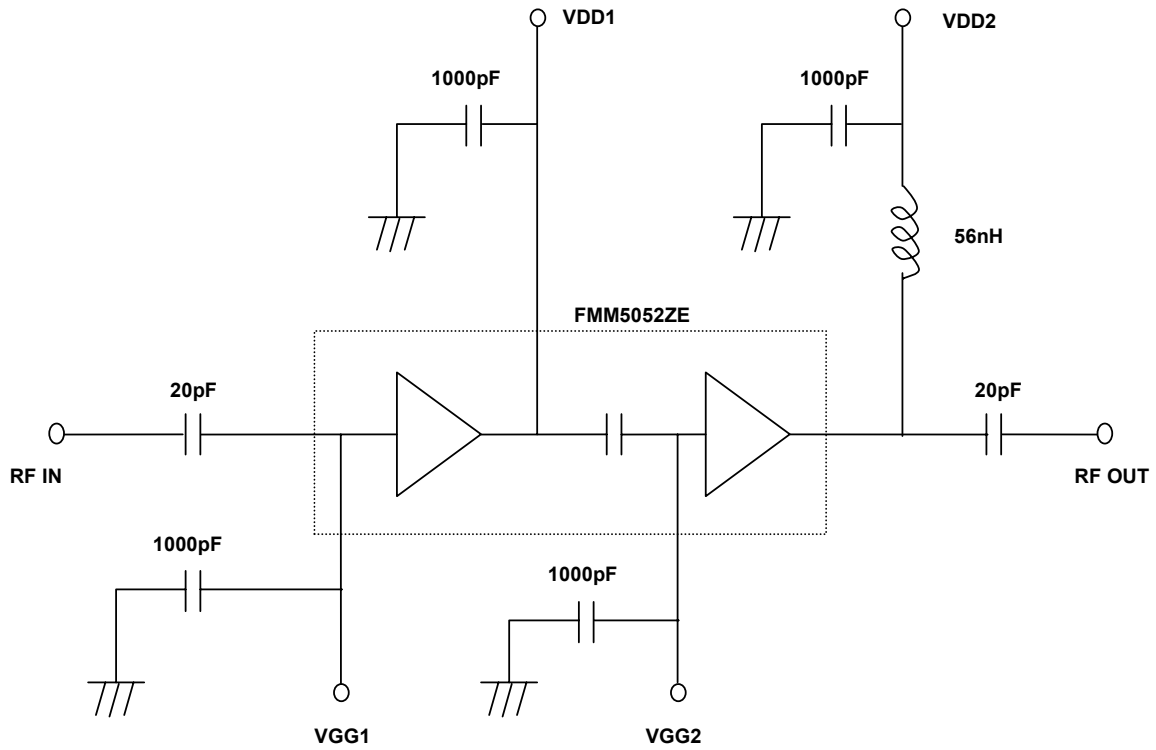
$t = 0.787\text{mm} \pm 0.051$ (including 0.018mm metalization (Cu) for both side)

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Recommended Bias Circuit and Internal Block Diagram



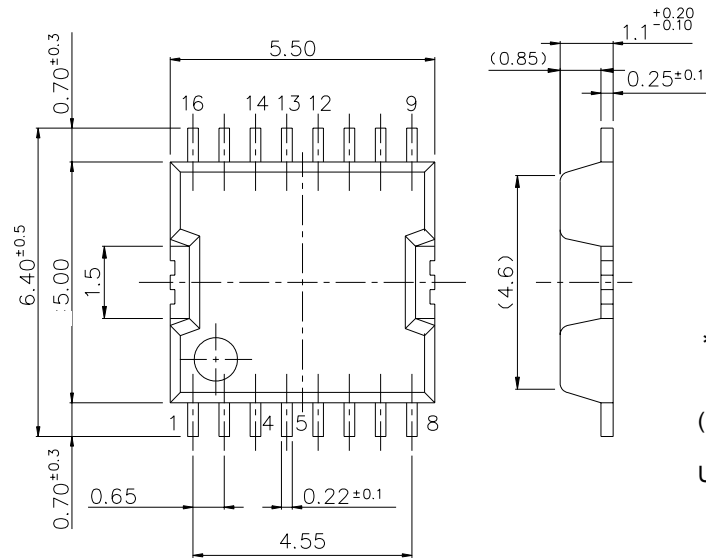
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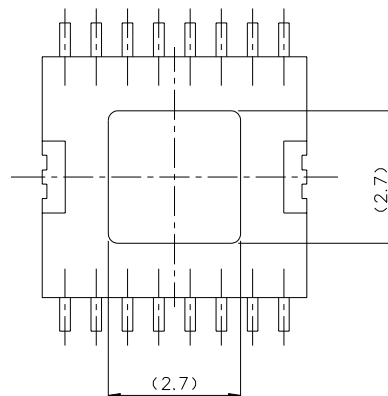
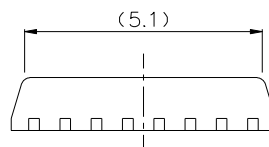
Package Outline



* General tolerance
: ±0.15mm

() : Reference value

Unit : mm



PIN ASSIGNMENT

- 1 : NC
- 2 : NC
- 3 : NC
- 4 : VDD1
- 5 : RF in
- 6 : NC
- 7 : NC
- 8 : NC
- 9 : NC
- 10 : NC
- 11 : NC
- 12 : VGG1
- 13 : VGG2
- 14 : RF out / VDD2
- 15 : NC
- 16 : NC

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CAUTION

Eudyna Devices Compound Semiconductor Products contain **gallium arsenide (GaAs)** which can be hazardous to the human body and the environment.

For safety, observe the following procedures:

- Do not put these products into the mouth.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.

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