POLYFET RF DEVICES

LDMOS

Lateral Double Diffuse MOS Transistor

The Next Generation
DMOS Technology

- **Vertical DMOS**
  - Bottom Side Drain
  - Source bond wire reducing gain
  - Higher Crss
  - BEO isolation
  - High Package Cost

- **Lateral DMOS**
  - Bottom Side Source
  - No source bondwire
  - 3 dB higher gain
  - Lower Crss
  - Higher Power
  - Higher Efficiency
  - Lower Package Cost
  - No BEO required
  - Improve theta jc
Cross Section VDMOS

Polyfet VDMOS

Source

Gate

Source

N+ Source

MOSFET

Pbody

V-Groove

Gate Oxide

Parasitic JFET

Drain
Cross Section LDMOS

- Source
- Drain
- Sinker
- N++ Source
- Pbody
- Gate Oxide
- N Drain
- Gate
- P epi
- P+ Substrate
Source Bond Wires

VDMOS WIRE BONDS

Gate Bond Wire

Source Bond Wire

Pkg

DIE

Bottom of Die is Drain - Vdd
Metal is connected to Ground

Source Bond Wire
Negative Feedback
Reduces Gain
VDMOS Crss

- Gate Oxide
- Gate
- Cgd
- N+ Source
- Pbody
- Cds
- Cdw
- Depletion Width
- Crss = Cgd + Cdw ≈ Cdw
  - Cdw decoupling Cgd

VDMOS Crss
LDMOS Crss
Packaging

VDMOS Requires BEO

Gate Bond Wire

Source Bond Wire

Bottom of Die is Drain - Vdd
Metal is connected to Ground

LDMOS No BEO

Gate Bond Wire

Drain Bond Wire

Bottom of Die is Drain - Vdd
Metal is connected to Ground
<table>
<thead>
<tr>
<th>Device</th>
<th>Power</th>
<th>Gain</th>
<th>Frequency</th>
<th>Efficiency</th>
<th>Connection</th>
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<tbody>
<tr>
<td>L88081</td>
<td>15W</td>
<td>12 dB</td>
<td>1000Mhz</td>
<td>60%</td>
<td>LX2</td>
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<tr>
<td>L88082</td>
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<td>L88013</td>
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<td>AQ</td>
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<tr>
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<td>60%</td>
<td>AP</td>
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<tr>
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<tr>
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