

# 0.5um ED-Mode PHEMT Process



- **GCS has developed a true E-mode high-efficiency power PHEMT process with optional E/D-PHEMT available for integrated switch, amplifier and digital control functions**
- **E-mode PHEMT has extremely low leakage current at zero gate bias**

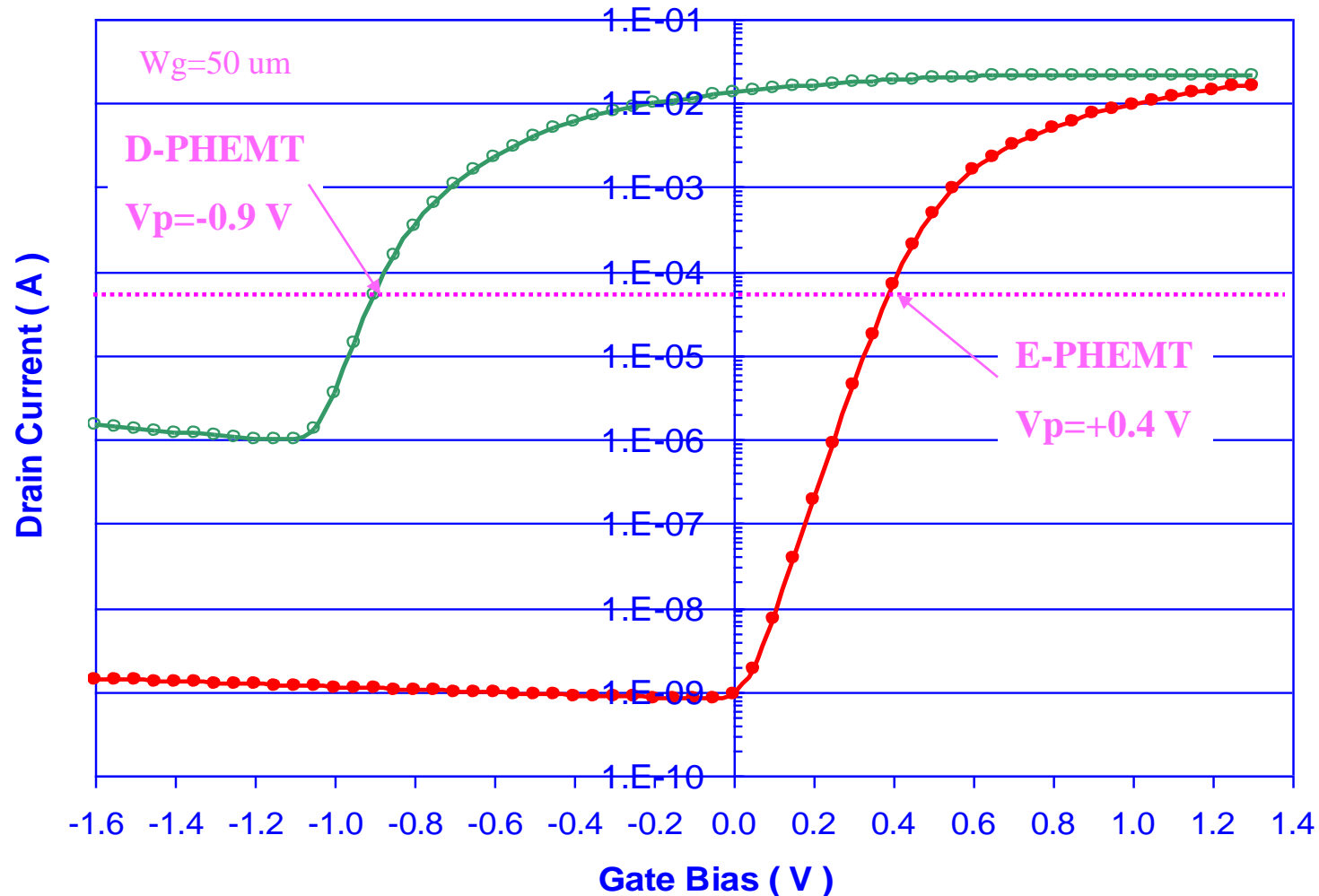
# 0.5um ED-Mode Characteristics



Parameters	D-PHEMT			E-PHEMT		
	min	max	typical	min	max	typical
<b>Vp ( V )</b>	<b>-1.1</b>	<b>-0.7</b>	<b>-0.9</b>	<b>0.25</b>	<b>0.55</b>	<b>0.4</b>
<b>Idss(mA/mm)</b>	<b>170</b>	<b>330</b>	<b>250</b>	<b>0.00000 5</b>	<b>0.0001</b>	<b>0.00002</b>
<b>Gm(mS/mm)</b>	<b>280</b>	<b>420</b>	<b>350</b>	<b>400</b>	<b>600</b>	<b>500</b>
<b>Imax(mA/mm)</b>	<b>380</b>	<b>520</b>	<b>450</b>	<b>180</b>	<b>320</b>	<b>250</b>
<b>Vgd(V)</b>	<b>9</b>	<b>16</b>	<b>12</b>	<b>18</b>	<b>35</b>	<b>28</b>
<b>Ron(Ohm.mm)</b>	<b>1.5</b>	<b>2.5</b>	<b>2</b>	<b>1.5</b>	<b>2.5</b>	<b>2</b>
<b>Ft (GHz)</b>	<b>28</b>	<b>38</b>	<b>33</b>	<b>21</b>	<b>35</b>	<b>28</b>
<b>Fmax (GHz)</b>	<b>55</b>	<b>35</b>	<b>45</b>	<b>55</b>	<b>125</b>	<b>90</b>

Vp @ Ids=1mA/mm and Vgd @ Igs=1mA/mm, Ron @ ( Vgs=0V D-PHEMT ) and ( Vgs=1V E-PHEMT )

# 0.5 $\mu$ m ED-Mode PHEMT Pinch-off Characteristics

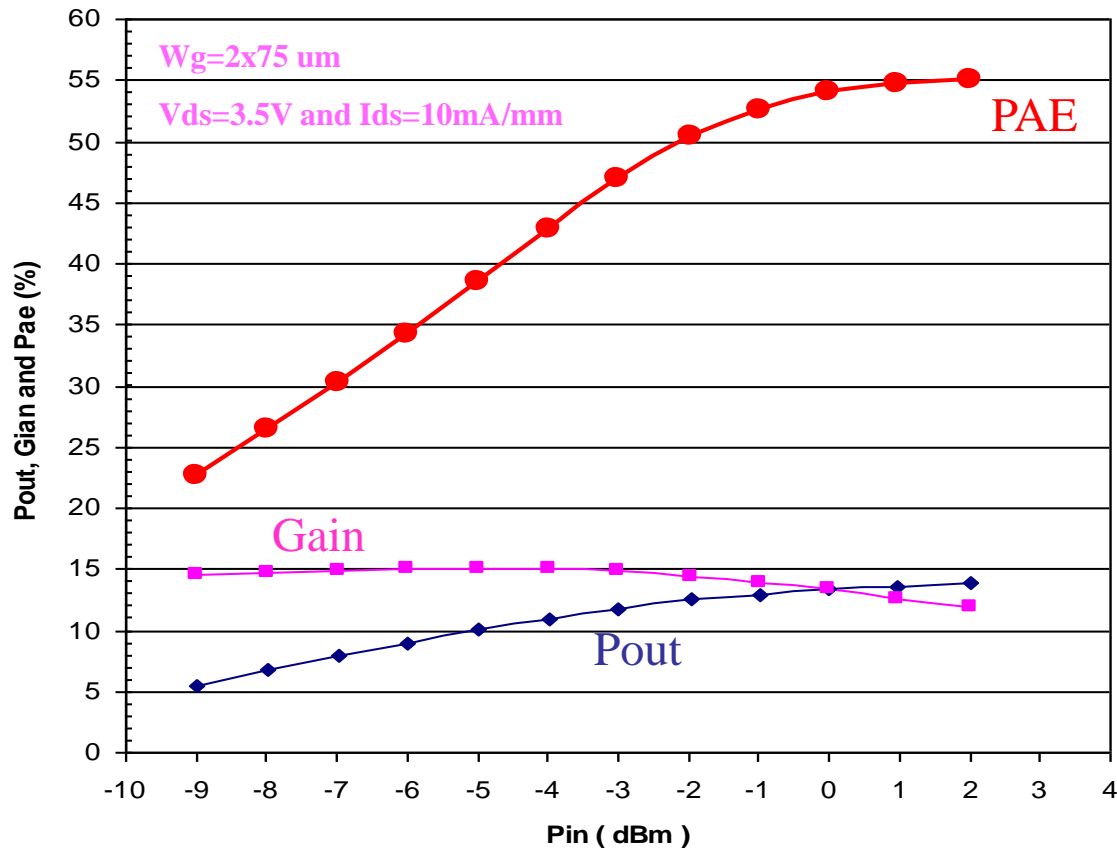


E-PHEMT :  $I_{dss} = 20$  nA/mm

# Power Performance of E-Mode PHEMT



**f = 2 GHz**



**P1dB=135 mW/mm and Psat=165 mW/mm**