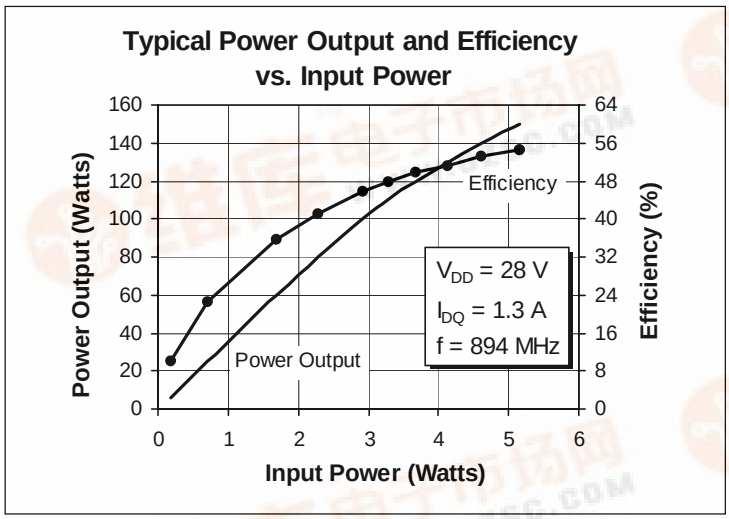
# PTF 10195
# 125 Watts, 869–894 MHz
# *GOLDMOS* ® Field Effect Transistor

## Description

The 10195 is an internally matched 125–watt *GOLDMOS* FET intended for cellular, GSM, D-AMPS, CDMA and EDGE applications. This device operates at 53% efficiency with 13 dB of gain minimum. Full gold metallization ensures excellent device lifetime and reliability.

- ***INTERNALLY MATCHED***
- **Performance at 894 MHz, 28 Volts**
  - **Output Power = 125 Watts**
  - **Power Gain = 14 dB Typical**
  - **Efficiency = 53% Typical**
- **Full Gold Metallization**
- **Excellent Thermal Stability**
- **100% Lot Traceability**





Package 20248

## RF Specifications (100% Tested)

| Characteristic | Symbol | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| **Gain**<br>($V_{DD}$ = 28 V, $P_{OUT}$ = 125 W, $I_{DQ}$ = 1300 mA, f = 894 MHz) | $G_{pe}$ | 13 | 14 | — | dB |
| **Power Output at 1 dB Compression**<br>($V_{DD}$ = 28 V, $I_{DQ}$ = 1300 mA, f = 894 MHz) | P-1dB | 125 | 140 | — | Watts |
| **Drain Efficiency**<br>($V_{DD}$ = 28 V, $P_{OUT}$ = 125 W, $I_{DQ}$ = 1300 mA, f = 894 MHz) | η | 45 | 53 | — | % |
| **Load Mismatch Tolerance**<br>($V_{DD}$ = 28 V, $P_{OUT}$ = 125 W, $I_{DQ}$ = 1300 mA, f = 894 MHz —all phase angles at frequency of test) | Ψ | 10:1 | — | — | — |

All published data at $T_{CASE}$ = 25°C unless otherwise indicated.



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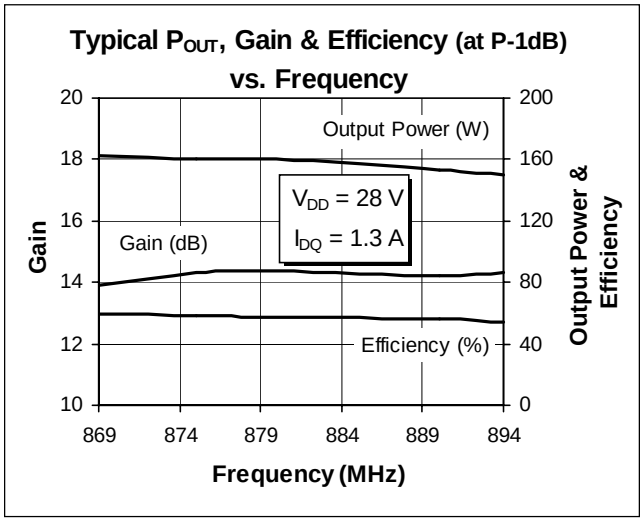
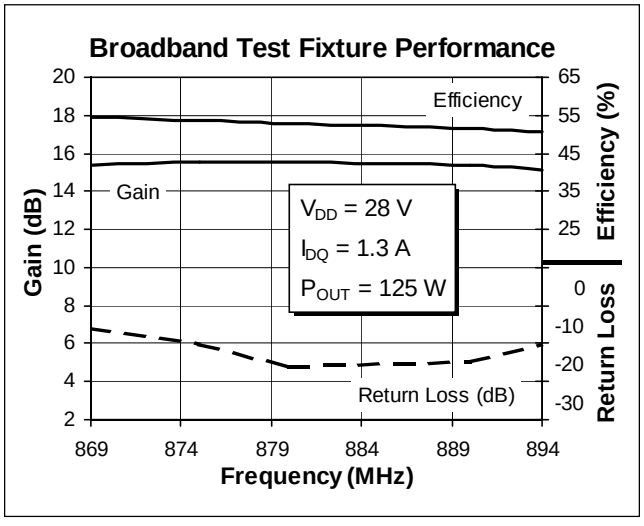
## Electrical Characteristics (100% Tested)

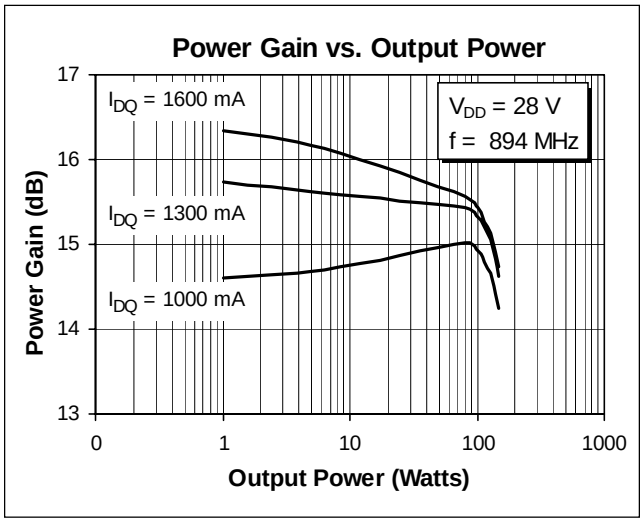
| Characteristic | Conditions | Symbol | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{GS}$ = 0 V, $I_D$ = 25 mA | $V_{(BR)DSS}$ | 65 | — | — | Volts |
| Drain-Source Leakage Current | $V_{DS}$ = 26 V, $V_{GS}$ = 0 V | $I_{DSS}$ | — | — | 1.0 | mA |
| Gate Threshold Voltage | $V_{DS}$ = 10 V, $I_D$ = 100 mA | $V_{GS(th)}$ | 3.0 | — | 5.0 | Volts |
| Forward Transconductance | $V_{DS}$ = 10 V, $I_D$ = 3 A | $g_{fs}$ | — | 3.0 | — | Siemens |

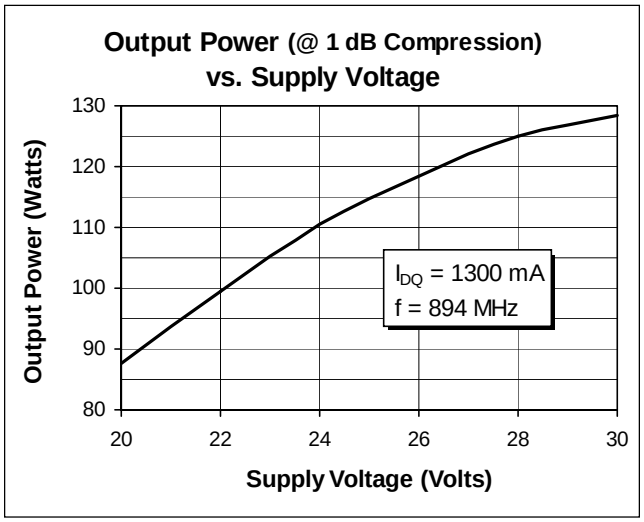
## Maximum Ratings

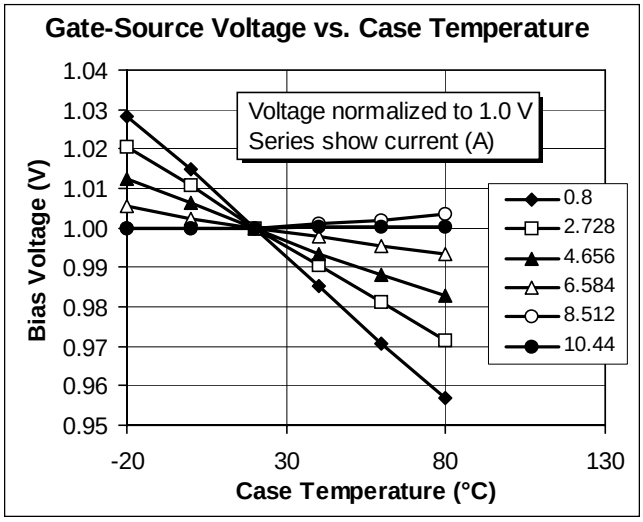
| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DSS}$ | 65 | Vdc |
| Gate-Source Voltage | $V_{GS}$ | ±20 | Vdc |
| Operating Junction Temperature | $T_J$ | 200 | °C |
| Total Device Dissipation<br>Above 25°C derate by | $P_D$ | 266<br>1.52 | Watts<br>W/°C |
| Storage Temperature Range | $T_{STG}$ | –40 to +150 | °C |
| Thermal Resistance ($T_{CASE}$ = 70°C) | $R_{\theta JC}$ | .66 | °C/W |

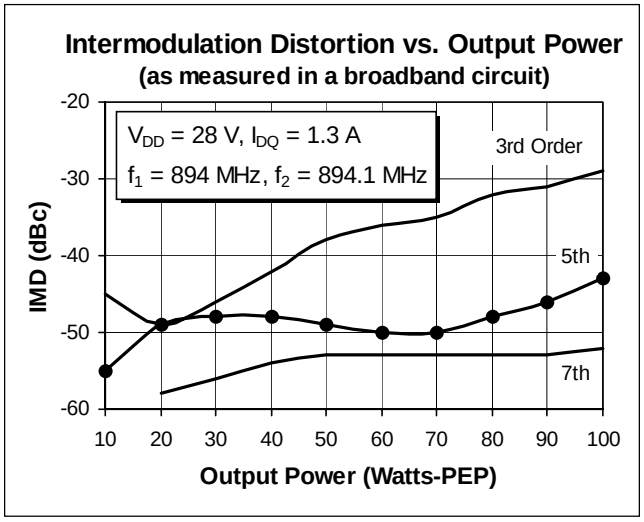


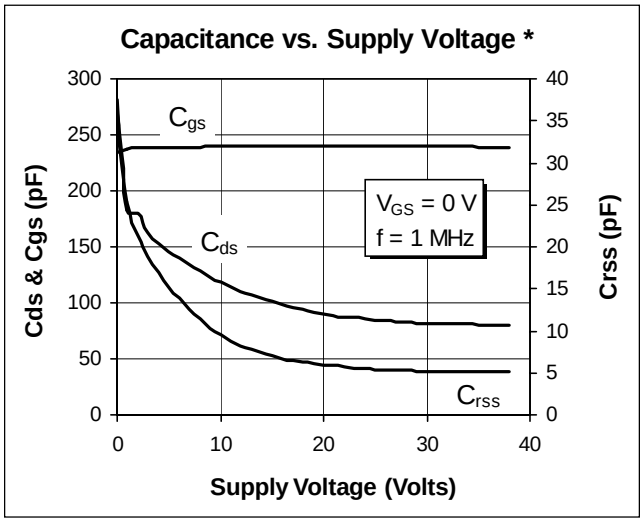






* This part is internally matched. Measurements of the finished product will not yield these figures.

# PTF 10195

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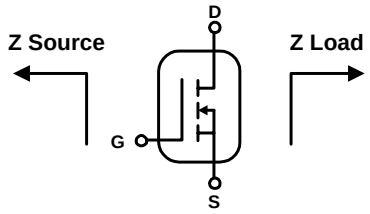
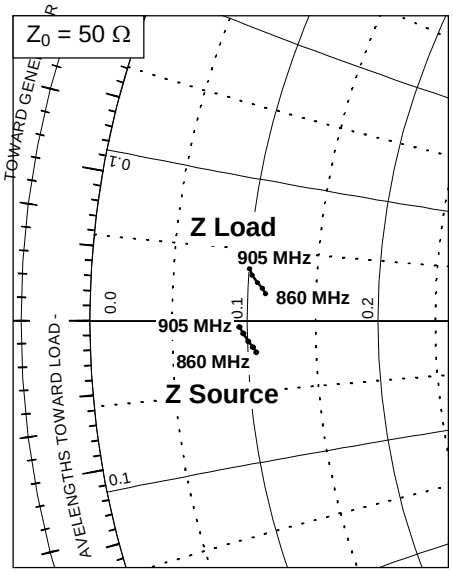
## Impedance Data

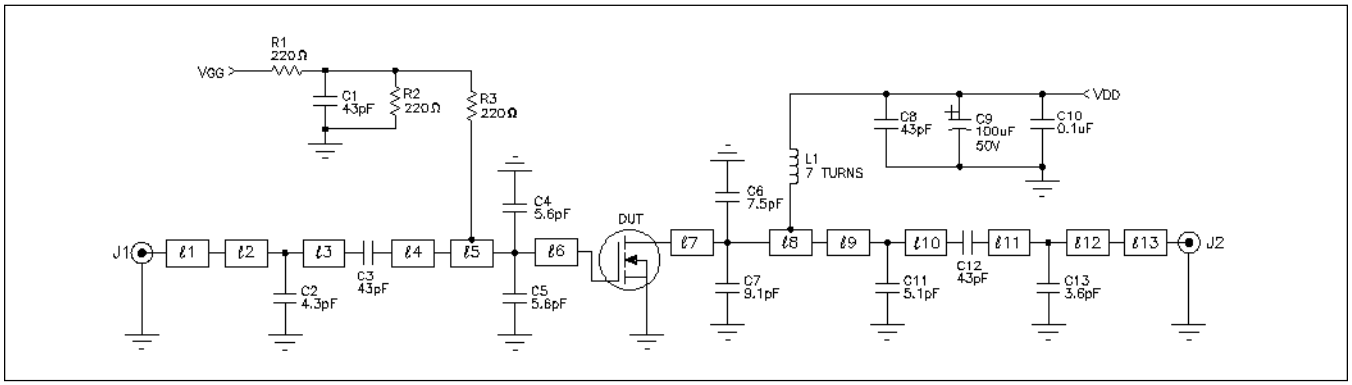
$V_{DD}$ = 28 V, $P_{OUT}$ = 125 W, $I_{DQ}$ = 1300 mA




| Frequency | Z Source Ω | | Z Load Ω | |
|---|---|---|---|---|
| MHz | R | jX | R | jX |
| 860 | 1.97 | -1.13 | 2.30 | 0.99 |
| 869 | 1.86 | -0.94 | 2.18 | 1.19 |
| 880 | 1.69 | -0.73 | 2.00 | 1.38 |
| 894 | 1.52 | -0.44 | 1.79 | 1.63 |
| 905 | 1.39 | -0.22 | 1.69 | 1.85 |

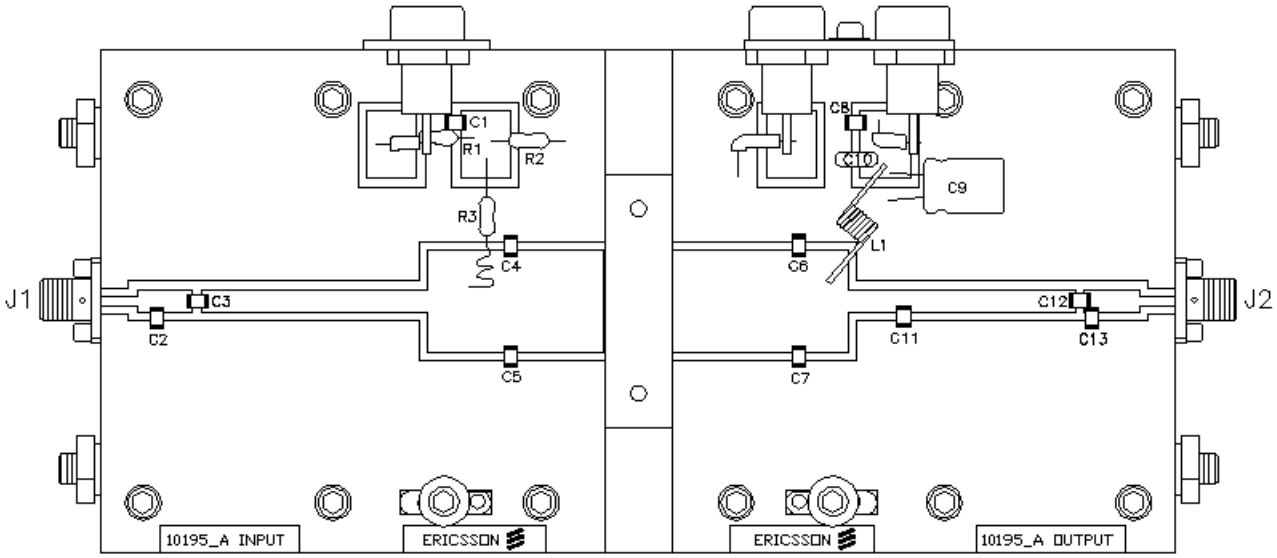
## Test Circuit



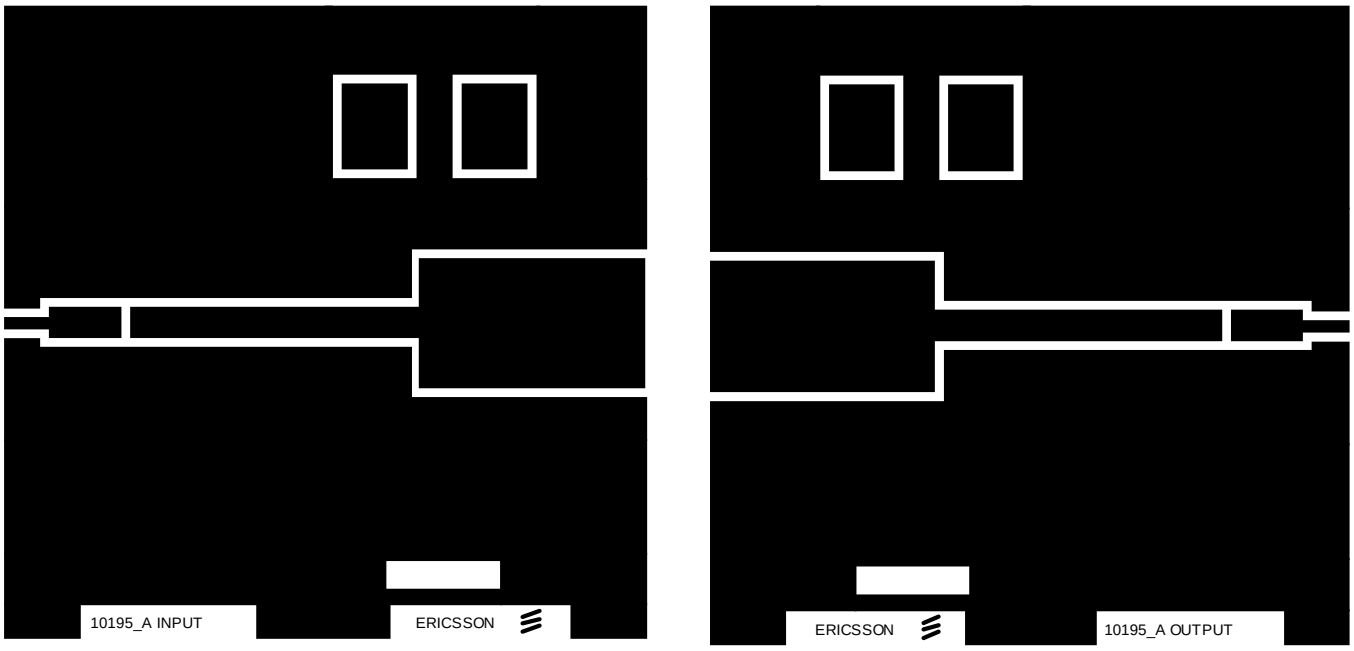

*Test Circuit Schematic for f = 894 MHz*

| | | |
|---|---|---|
| DUT | PTF 10195 | LDMOS Transistor |
| ℓ1 | 0.0273 λ 894 MHz Microstrip 50 Ω | |
| ℓ2 | 0.0244 λ 894 MHz Microstrip 30 Ω | |
| ℓ3 | 0.0204 λ 894 MHz Microstrip 30 Ω | |
| ℓ4 | 0.1800 λ 894 MHz Microstrip 30Ω | |
| ℓ5 | 0.0715 λ 894 MHz Microstrip 8.63Ω | |
| ℓ6 | 0.0802 λ 894 MHz Microstrip 8.63 Ω | |
| ℓ7 | 0.1026 λ 894 MHz Microstrip 8.63 Ω | |
| ℓ8 | 0.0491 λ 894 MHz Microstrip 8.63 Ω | |
| ℓ9 | 0.0389 λ 894 MHz Microstrip 30Ω | |
| ℓ10 | 0.1411 λ 894 MHz Microstrip 30 Ω | |
| ℓ11 | 0.0116 λ 894 MHz Microstrip 30 Ω | |
| ℓ12 | 0.0428 λ 894 MHz Microstrip 30 Ω | |
| ℓ13 | 0.0293 λ 894 MHz Microstrip 50 Ω | |

| | | |
|---|---|---|
| C1, C3, C8, C12 | Capacitor, 43pF | 100B 430 |
| C2 | Capacitor, 4.3pF | 100B 4R3 |
| C4, C5 | Capacitor, 5.6pF | 100B 5R6 |
| C6 | Capacitor, 7.5pF | 100B 7R5 |
| C7 | Capacitor, 9.1pF | 100B 9R1 |
| C11 | Capacitor, 5.1pF | 100B 5R1 |
| C13 | Capacitor, 3.6pF | 100B 3R6 |
| C10 | Capacitor, 0.1uF | Digi-KeyP4525-ND |
| C9 | Capacitor,100uF,50V | Digi-KeyP5182-ND |
| J1,J2 | Connector, SMA, Female, Panel Mount | 1301-RPM 513 412/53 |
| L1 | 7 Turns,22AWG,.120 DIA I.D. | N/A |
| R1, R2,R3 | Resistor, 220ohm | Digi-Key 220QBK-ND |
| Circuit Board | .031" thick, $\varepsilon$r = 4.0, G200 | AlliedSignal |




*Components Layout (not to scale)*




*Artwork (not to scale)*

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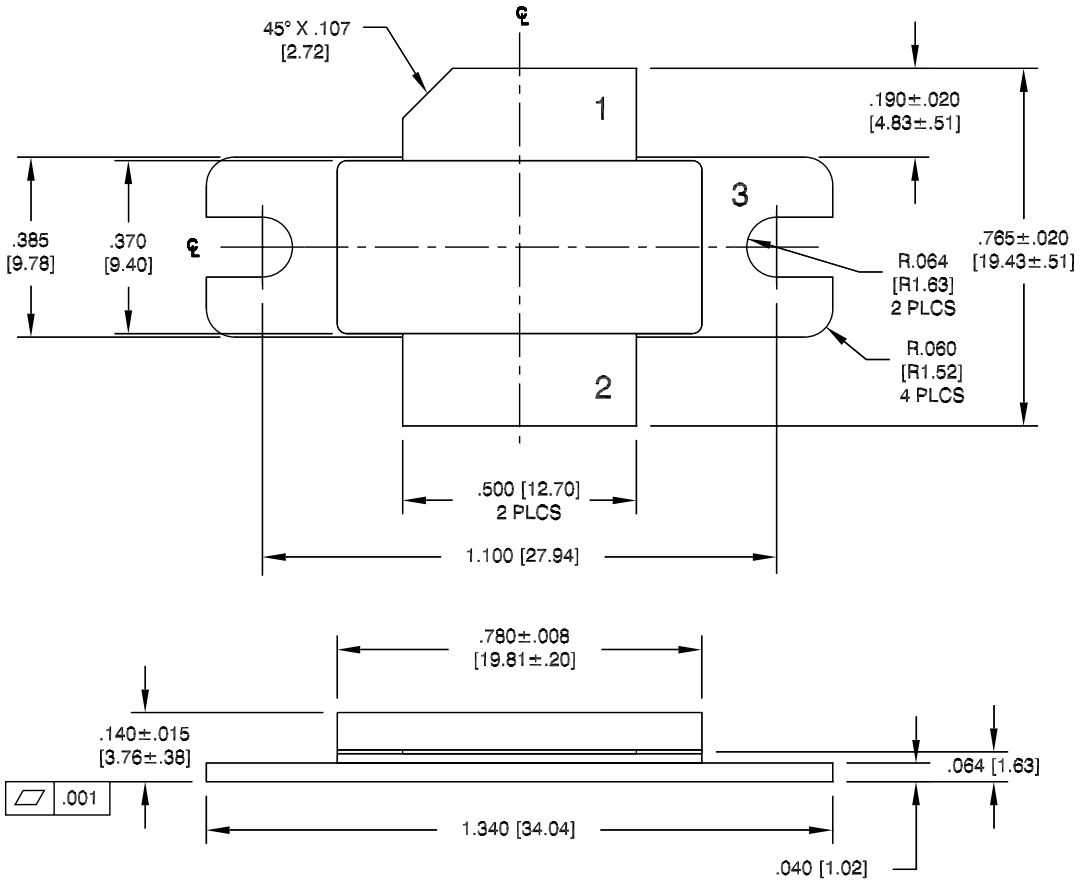
## Case Outline Specifications

### Package 20248




Unless otherwise specified
all tolerance ±0.005" [0.13mm]

Pins: 1. Drain 2. Gate 3. Source
Lead Thickness: 0.004 +0.002/-0.001"
[0.10 +.05/-0.03mm]

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