



**THE DATASHEET OF
MMBF4416LT1**



MMBF4416LT1

Preferred Device

JFET VHF/UHF Amplifier Transistor

N-Channel

Features

- Pb-Free Package is Available

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|----------------------|----------|-------|------|
| Drain-Source Voltage | V_{DS} | 30 | Vdc |
| Drain-Gate Voltage | V_{DG} | 30 | Vdc |
| Gate-Source Voltage | V_{GS} | 30 | Vdc |
| Gate Current | I_G | 10 | mAdc |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--|-----------------|-------------|----------------------------|
| Total Device Dissipation FR-5 Board, (Note 1) $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 225 1.8 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 556 | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

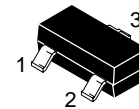
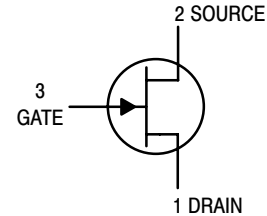
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. FR-5 = 1.0 x 0.75 x 0.062 in.



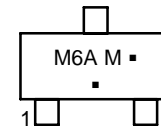
ON Semiconductor®

<http://onsemi.com>



SOT-23 (TO-236)
CASE 318
STYLE 10

MARKING DIAGRAM



M6A = Device Code
M = Date Code*
■ = Pb-Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon manufacturing location.

ORDERING INFORMATION

| Device | Package | Shipping† |
|--------------|---------------------|---------------------|
| MMBF4416LT1 | SOT-23 | 3,000 / Tape & Reel |
| MMBF4416LT1G | SOT-23 (Pb-Free) | 3,000 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

Preferred devices are recommended choices for future use and best overall value.

MMBF4416LT1

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|---|---------------|------|------------|------------------|
| OFF CHARACTERISTICS | | | | |
| Gate-Source Breakdown Voltage ($I_G = 1.0 \mu\text{Adc}$, $V_{DS} = 0$) | $V_{(BR)GSS}$ | 30 | - | Vdc |
| Gate Reverse Current ($V_{GS} = 20 \text{Vdc}$, $V_{DS} = 0$) ($V_{GS} = 20 \text{Vdc}$, $V_{DS} = 0$, $T_A = 150^\circ\text{C}$) | I_{GSS} | - | 1.0 200 | nAdc |
| Gate Source Cutoff Voltage ($I_D = 1.0 \text{nAdc}$, $V_{DS} = 15 \text{Vdc}$) | $V_{GS(off)}$ | - | -6.0 | Vdc |
| Gate Source Voltage ($I_D = 0.5 \text{mAdc}$, $V_{DS} = 15 \text{Vdc}$) | V_{GS} | -1.0 | -5.5 | Vdc |
| ON CHARACTERISTICS | | | | |
| Zero-Gate-Voltage Drain Current ($V_{GS} = 15 \text{Vdc}$, $V_{GS} = 0$) | I_{DSS} | 5.0 | 15 | mAdc |
| Gate-Source Forward Voltage ($I_G = 1.0 \text{mAdc}$, $V_{DS} = 0$) | $V_{GS(f)}$ | - | 1.0 | Vdc |
| SMALL-SIGNAL CHARACTERISTICS | | | | |
| Forward Transfer Admittance ($V_{DS} = 15 \text{Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{kHz}$) | $ Y_{fs} $ | 4500 | 7500 | μmhos |
| Output Admittance ($V_{DS} = 15 \text{Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{kHz}$) | $ y_{os} $ | - | 50 | μmhos |
| Input Capacitance ($V_{DS} = 15 \text{Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{MHz}$) | C_{iss} | - | 4.0 | pF |
| Reverse Transfer Capacitance ($V_{DS} = 15 \text{Vdc}$, $V_{GS} = 0$, $f = 10 \text{MHz}$) | C_{rss} | - | 0.8 | pF |
| Output Capacitance ($V_{DS} = 15 \text{Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{MHz}$) | C_{oss} | - | 2.0 | pF |

COMMON SOURCE CHARACTERISTICS ADMITTANCE PARAMETERS

($V_{DS} = 15 \text{Vdc}$, $T_{channel} = 25^\circ\text{C}$)

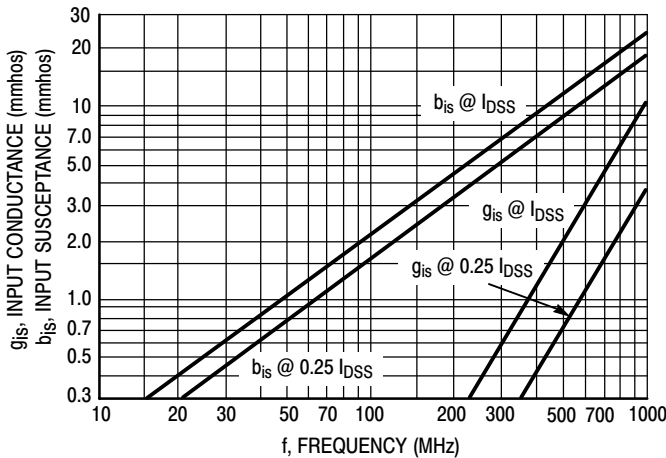


Figure 1. Input Admittance (y_{is})

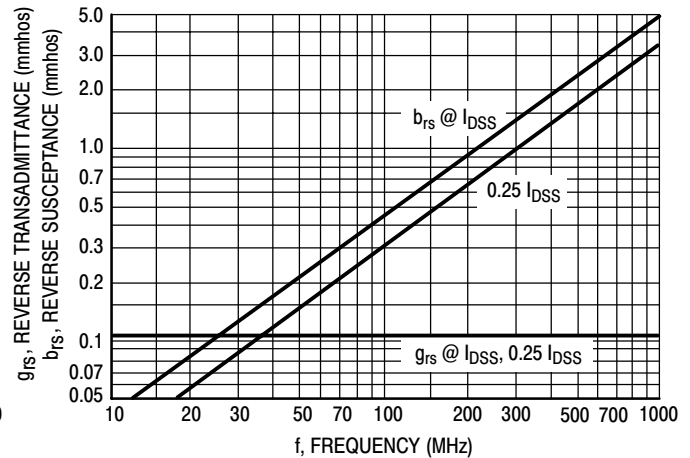


Figure 2. Reverse Transfer Admittance (y_{rs})

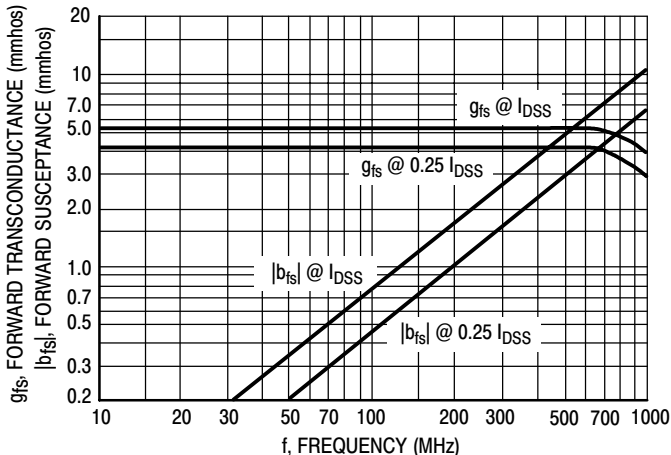


Figure 3. Forward Transadmittance (y_{fs})

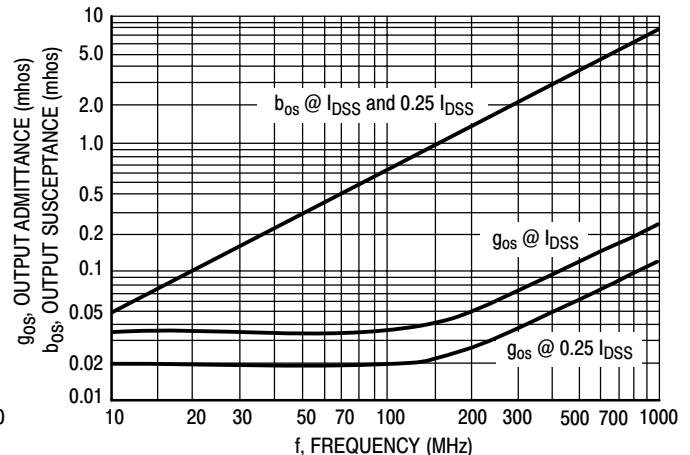


Figure 4. Output Admittance (y_{os})

COMMON SOURCE CHARACTERISTICS
S-PARAMETERS

($V_{DS} = 15 \text{ Vdc}$, $T_{\text{channel}} = 25^\circ\text{C}$, Data Points in MHz)

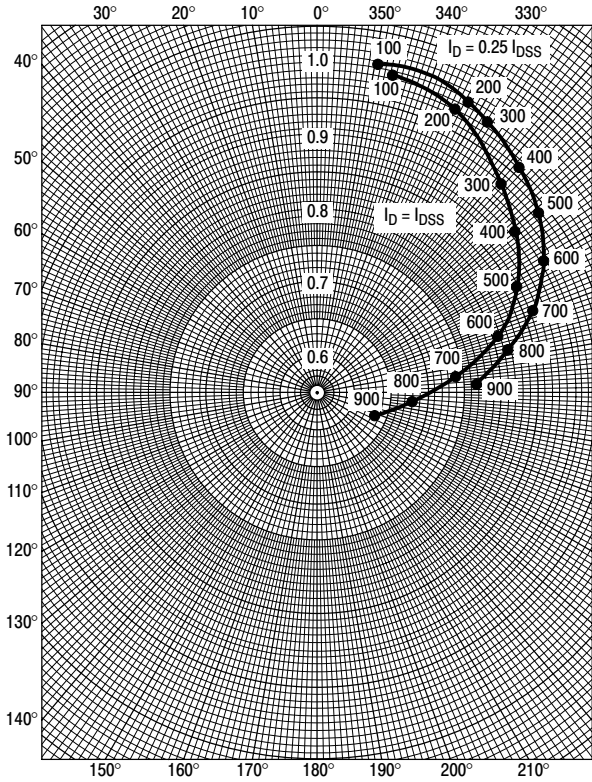


Figure 5. S_{11s}

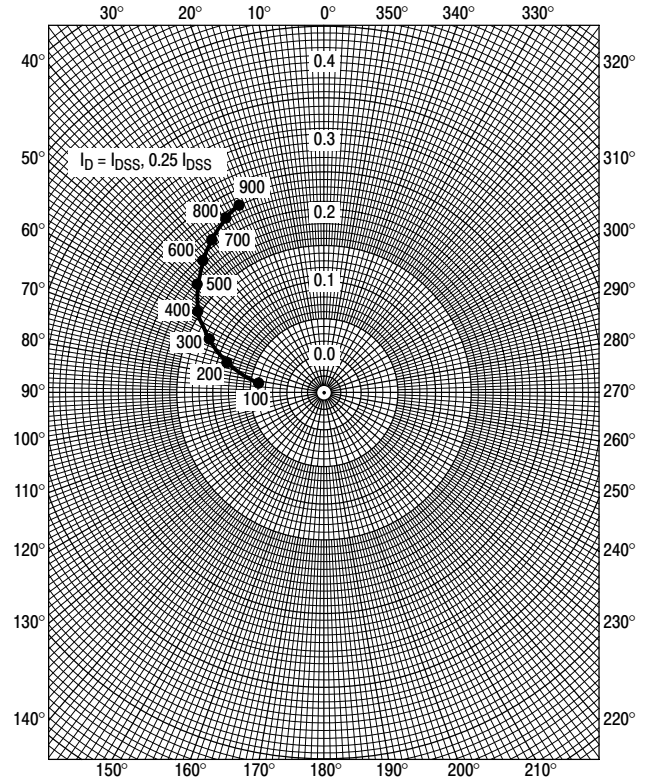


Figure 6. S_{12s}

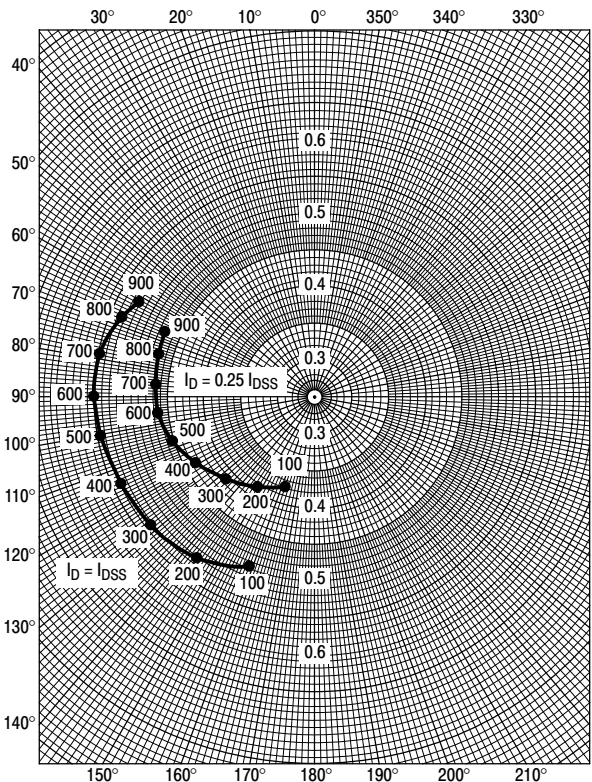


Figure 7. S_{21s}

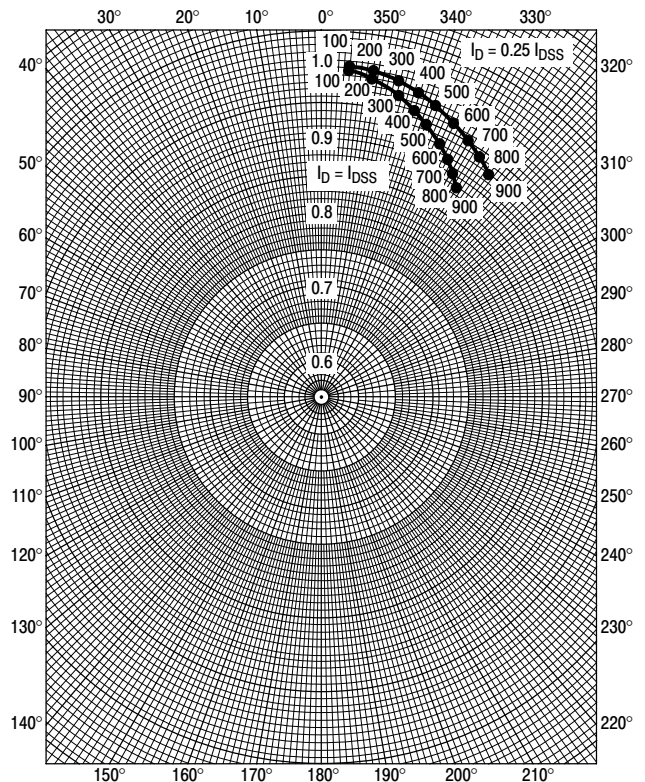


Figure 8. S_{22s}

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COMMON GATE CHARACTERISTICS ADMITTANCE PARAMETERS

($V_{DG} = 15 \text{ Vdc}$, $T_{\text{channel}} = 25^\circ\text{C}$)

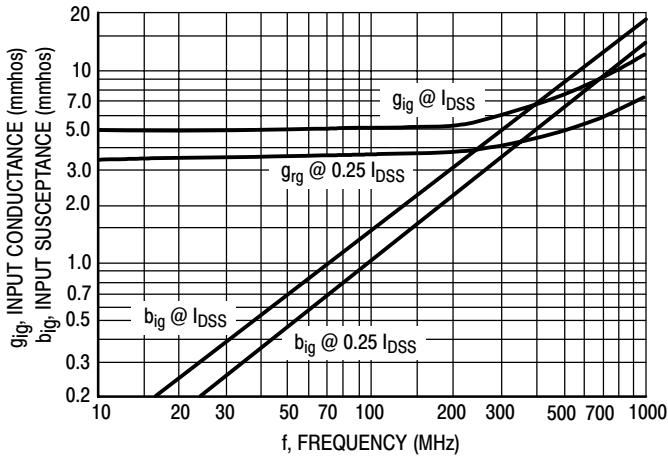


Figure 9. Input Admittance (y_{ig})

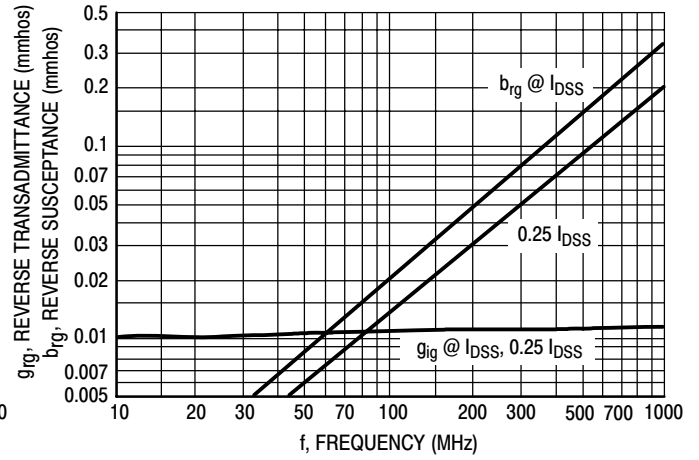


Figure 10. Reverse Transfer Admittance (y_{rg})

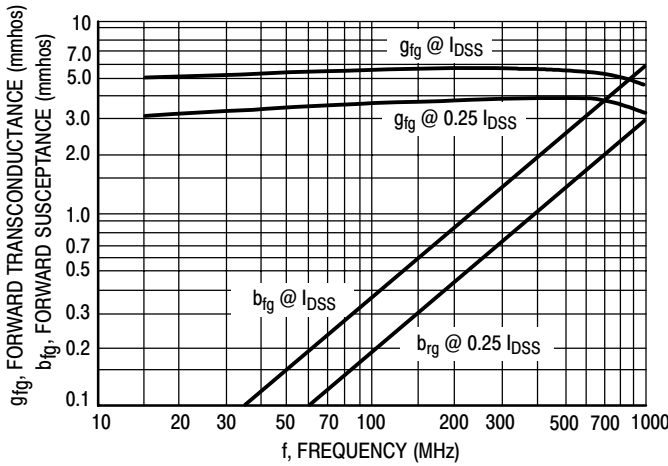


Figure 11. Forward Transfer Admittance (y_{fg})

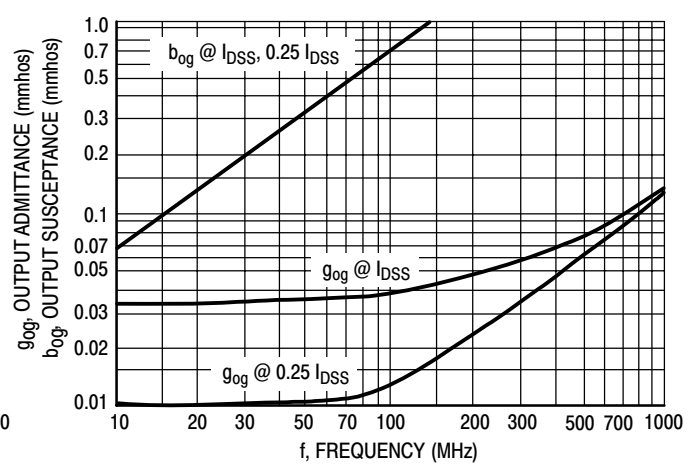


Figure 12. Output Admittance (y_{og})

COMMON GATE CHARACTERISTICS
S-PARAMETERS

($V_{DS} = 15$ Vdc, $T_{channel} = 25^{\circ}\text{C}$, Data Points in MHz)

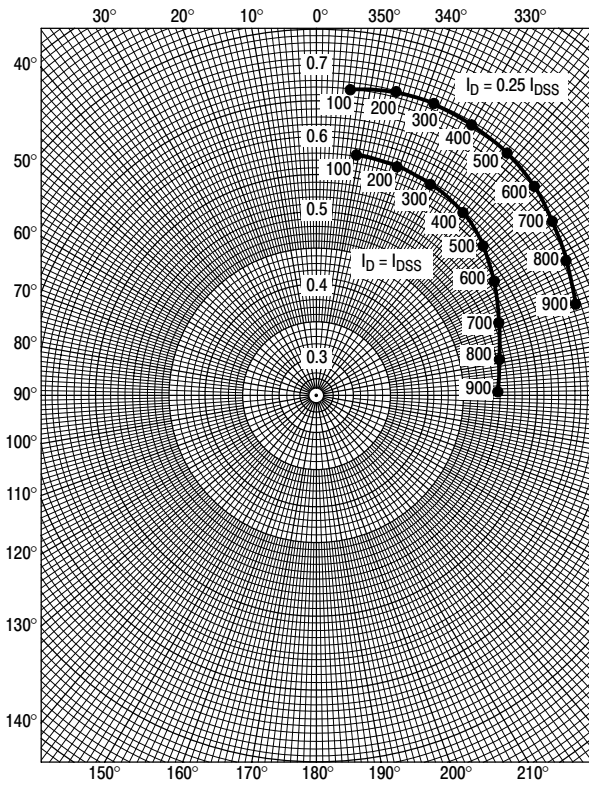


Figure 13. S_{11g}

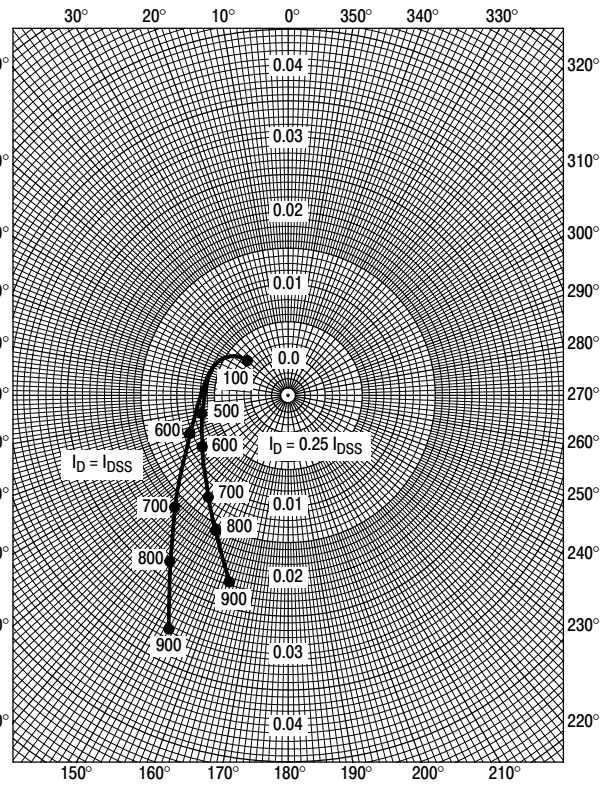


Figure 14. S_{12g}

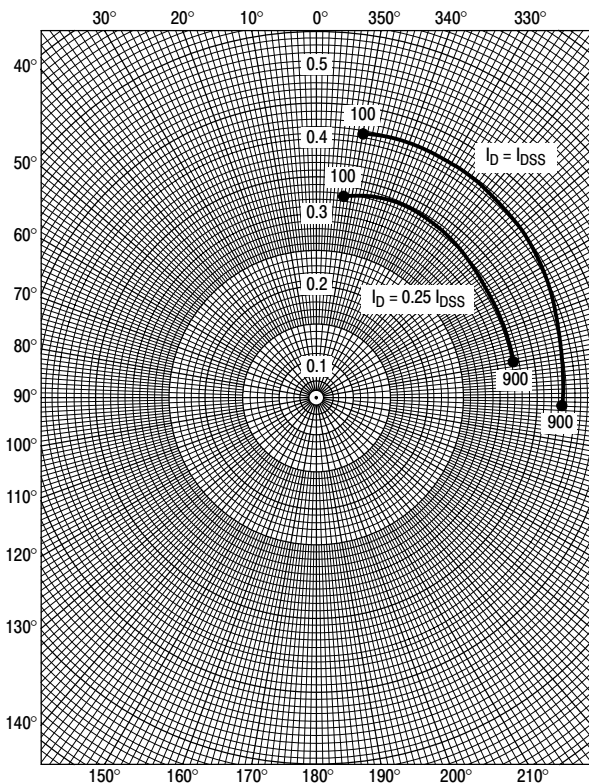


Figure 15. S_{21g}

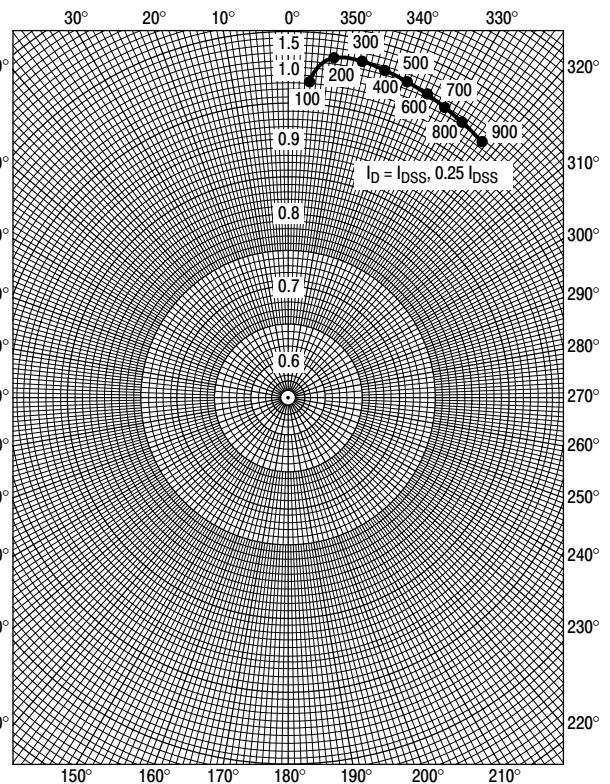
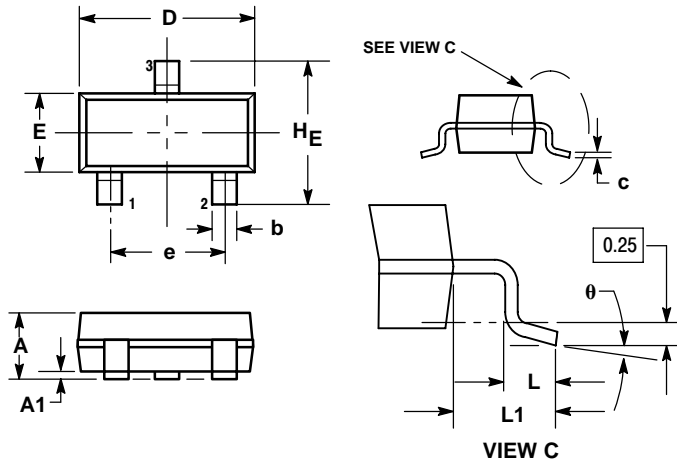


Figure 16. S_{22g}

MMBF4416LT1

PACKAGE DIMENSIONS

SOT-23 (TO-236)
CASE 318-08
ISSUE AN



NOTES:

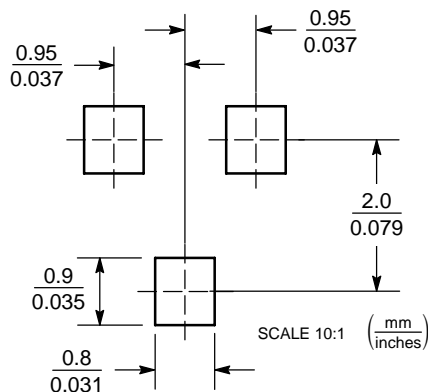
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.89 | 1.00 | 1.11 | 0.035 | 0.040 | 0.044 |
| A1 | 0.01 | 0.06 | 0.10 | 0.001 | 0.002 | 0.004 |
| b | 0.37 | 0.44 | 0.50 | 0.015 | 0.018 | 0.020 |
| c | 0.09 | 0.13 | 0.18 | 0.003 | 0.005 | 0.007 |
| D | 2.80 | 2.90 | 3.04 | 0.110 | 0.114 | 0.120 |
| E | 1.20 | 1.30 | 1.40 | 0.047 | 0.051 | 0.055 |
| e | 1.78 | 1.90 | 2.04 | 0.070 | 0.075 | 0.081 |
| L | 0.10 | 0.20 | 0.30 | 0.004 | 0.008 | 0.012 |
| L1 | 0.35 | 0.54 | 0.69 | 0.014 | 0.021 | 0.029 |
| HE | 2.10 | 2.40 | 2.64 | 0.083 | 0.094 | 0.104 |

STYLE 10:

1. DRAIN
2. SOURCE
3. GATE

SOLDERING FOOTPRINT*



*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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