New Jersey Semi-Conductor Products, Inc.

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MRF136
MRF136Y

15 W, 30 W 2–400 MHz
N-CHANNEL
TMOS BROADBAND
RF POWER FETs

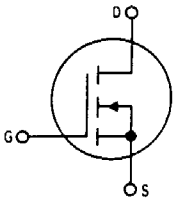
The RF TMOS Line
RF Power Field-Effect Transistors
N-Channel Enhancement-Mode TMOS

. . . designed for wideband large-signal amplifier and oscillator applications in the 2 to 400 MHz range, in either single ended or push-pull configuration.

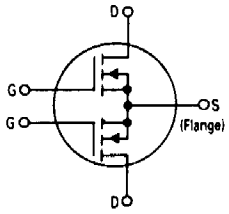
- Guaranteed 28 Volt, 150 MHz Performance
  MRF136
  Output Power = 15 Watts
  Narrowband Gain = 16 dB (Typ)
  Efficiency = 60% (Typical)
  MRF136Y
  Output Power = 30 Watts
  Broadband Gain = 14 dB (Typ)
  Efficiency = 54% (Typical)
- Small-Signal and Large-Signal Characterization
- 100% Tested For Load Mismatch At All Phase Angles With 30:1 VSWR
- Space Saving Package For Push-Pull Circuit Applications — MRF136Y
- Excellent Thermal Stability, Ideally Suited For Class A Operation
- Facilitates Manual Gain Control, ALC and Modulation Techniques

TMOS™

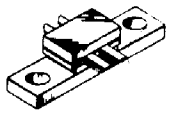
MRF136



MRF136Y



MRF136



MRF136Y

MAXIMUM RATINGS

Rating	Symbol	Value		Unit
		MRF136	MRF136Y	
Drain-Source Voltage	V_{DSS}	65	65	Vdc
Drain-Gate Voltage (R_{GS} = 1 MΩ)	V_{DGR}	65	65	Vdc
Gate-Source Voltage	V_{GS}	±40		Vdc
Drain-Current — Continuous	I_D	2.5	5	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	55 0.314	100 0.571	Watts W/°C
Storage Temperature Range	T_{stg}	−65 to +150		°C
Operating Junction Temperature	T_J	200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max		Unit
		MRF136	MRF136Y	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	3.2	1.75	°C/W

Handling and Packaging — MOS devices are susceptible to damage from electrostatic charge. Reasonable precautions in handling and packaging MOS devices should be observed.

Quality Semi-Conductors

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS (NOTE 1)					
Drain-Source Breakdown Voltage (V_{GS} = 0, I_D = 5 mA)	$V_{(BR)DSS}$	65	—	—	Vdc
Zero-Gate Voltage Drain Current (V_{DS} = 28 V, V_{GS} = 0)	I_{DSS}	—	—	2	mAdc
Gate-Source Leakage Current (V_{GS} = 40 V, V_{DS} = 0)	I_{GSS}	—	—	1	μAdc
ON CHARACTERISTICS (NOTE 1)					
Gate Threshold Voltage (V_{DS} = 10 V, I_D = 25 mA)	$V_{GS(th)}$	1	3	6	Vdc
Forward Transconductance (V_{DS} = 10 V, I_D = 250 mA)	g_{fs}	250	400	—	mmhos
DYNAMIC CHARACTERISTICS (NOTE 1)					
Input Capacitance (V_{DS} = 28 V, V_{GS} = 0, f = 1 MHz)	C_{iss}	—	24	—	pF
Output Capacitance (V_{DS} = 28 V, V_{GS} = 0, f = 1 MHz)	C_{oss}	—	27	—	pF
Reverse Transfer Capacitance (V_{DS} = 28 V, V_{GS} = 0, f = 1 MHz)	C_{rss}	—	5.5	—	pF
FUNCTIONAL CHARACTERISTICS (NOTE 2)					
Noise Figure MRF136 (V_{DS} = 28 Vdc, I_D = 500 mA, f = 150 MHz)	NF	—	1	—	dB
Common Source Power Gain (Figure 1) MRF136 (V_{DD} = 28 Vdc, P_{out} = 15 W, f = 150 MHz, I_{DQ} = 25 mA)	G_{ps}	13	16	—	dB
Common Source Power Gain (Figure 2) MRF136Y (V_{DD} = 28 Vdc, P_{out} = 30 W, f = 150 MHz, I_{DQ} = 100 mA)	G_{ps}	12	14	—	dB
Drain Efficiency (Figure 1) MRF136 (V_{DD} = 28 Vdc, P_{out} = 15 W, f = 150 MHz, I_{DQ} = 25 mA)	η	50	60	—	%
Drain Efficiency (Figure 2) MRF136Y (V_{DD} = 28 Vdc, P_{out} = 30 W, f = 150 MHz, I_{DQ} = 100 mA)	η	50	54	—	%
Electrical Ruggedness (Figure 1) MRF136 (V_{DD} = 28 Vdc, P_{out} = 15 W, f = 150 MHz, I_{DQ} = 25 mA, VSWR 30:1 at all Phase Angles)	ψ	No Degradation in Output Power			
Electrical Ruggedness (Figure 2) MRF136Y (V_{DD} = 28 Vdc, P_{out} = 30 W, f = 150 MHz, I_{DQ} = 100 mA, VSWR 30:1 at all Phase Angles)	ψ	No Degradation in Output Power			

Notes: 1. For MRF136Y, each side measured separately.
2. For MRF136Y measured in push-pull configuration.