

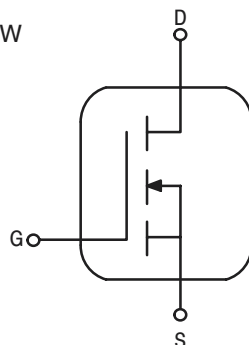
The RF MOSFET Line
RF Power Field Effect Transistor
N-Channel Enhancement-Mode Lateral MOSFET

MRF6522-10R1

960 MHz, 10 W, 26 V
LATERAL N-CHANNEL
RF POWER MOSFET

Designed for Class A-AB common source, linear power amplifiers in the 960 MHz range. The MRF6522-10R1 has been specifically designed for use in Communications Network (GSM) base stations. The package offers the advantage of SMD.

- Specified 26 Volts, 960 MHz, Class AB Characteristics
Output Power = 10 Watts CW
Power Gain = 15 dB Min @ 960 MHz, 10 Watts CW
Drain Efficiency = 48% Min @ 960 MHz, 10 Watts CW
- Excellent Thermal Stability
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- S-Parameter Characterization at High Bias Levels
- Bottom Side Source Eliminates DC Isolators, Reducing Common Mode Inductances
- In Tape and Reel. R1 Suffix = 500 Units per 12 mm, 7 inch Reel.



CASE 458C-03, STYLE 1
NI-200Z

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	Vdc
Gate-Source Voltage	V_{GS}	± 20	Vdc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	29 0.17	Watts W/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$
Operating Junction Temperature	T_J	200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (1)	$R_{\theta JC}$	4.0	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage ($V_{GS} = 0$ Vdc, $I_D = 0.2$ mA)	$V_{(BR)DSS}$	65	—	—	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = 26$ Vdc, $V_{GS} = 0$ Vdc)	I_{DSS}	—	—	1.0	μAdc
Gate-Source Leakage Current ($V_{GS} = 20$ Vdc, $V_{DS} = 0$ Vdc)	I_{GSS}	—	—	1.0	μAdc

(1) Thermal resistance is determined under specified RF operating condition.

NOTE - CAUTION - MOS devices are susceptible to damage from electrostatic charge. Reasonable precautions in handling and packaging MOS devices should be observed.

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

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

ON CHARACTERISTICS

Gate Threshold Voltage ($V_{DS} = 10\text{ V}$, $I_D = 50\ \mu\text{A}$)	$V_{GS(th)}$	1.25	3.0	4.0	Vdc
Gate Quiescent Voltage ($V_{DS} = 26\text{ Vdc}$, $I_D = 100\text{ mA}$)	$V_{GS(Q)}$	2.25	4.0	5.0	Vdc
Drain–Source On–Voltage ($V_{GS} = 10\text{ V}$, $I_D = 0.5\text{ A}$)	$V_{DS(on)}$	—	—	0.9	Vdc

DYNAMIC CHARACTERISTICS

Input Capacitance ($V_{DS} = 26\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1.0\text{ MHz}$)	C_{iss}	—	17	—	pF
Output Capacitance ($V_{DS} = 26\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1.0\text{ MHz}$)	C_{oss}	—	10	—	pF
Reverse Transfer Capacitance ($V_{DS} = 26\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1.0\text{ MHz}$)	C_{rss}	—	0.9	—	pF

FUNCTIONAL TESTS (In Motorola Test Fixture, 50 ohm system)

Common–Source Power Gain ($V_{DS} = 26\text{ V}$, $P_{out} = 10\text{ W CW}$, $I_{DQ} = 100\text{ mA}$, $f = 960\text{ MHz}$)	G_{ps}	15	17	—	dB
Drain Efficiency ($V_{DS} = 26\text{ V}$, $P_{out} = 10\text{ W CW}$, $I_{DQ} = 100\text{ mA}$, $f = 960\text{ MHz}$)	η	48	50	—	%
Input Return Loss ($V_{DS} = 26\text{ V}$, $P_{out} = 10\text{ W CW}$, $I_{DQ} = 100\text{ mA}$, $f = 960\text{ MHz}$)	IRL	—	—	–9	dB

TYPICAL CHARACTERISTICS

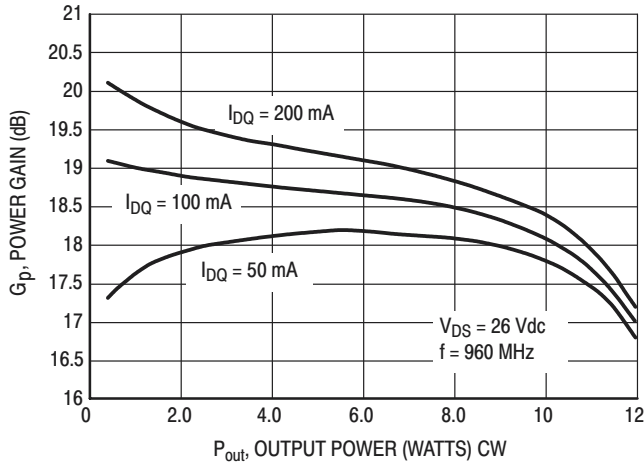


Figure 1. Power Gain versus Output Power

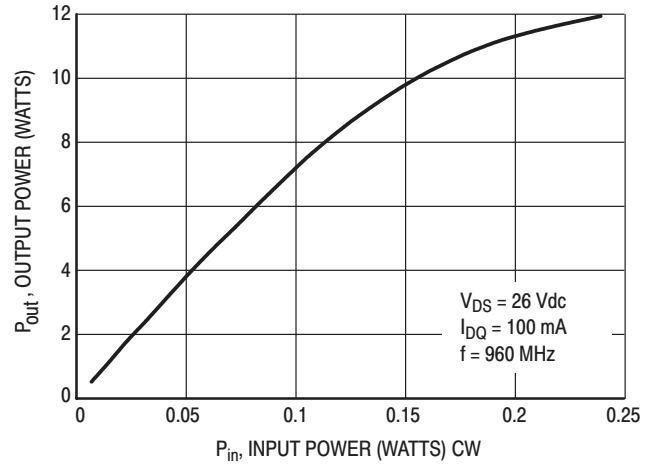


Figure 2. Output Power versus Input Power

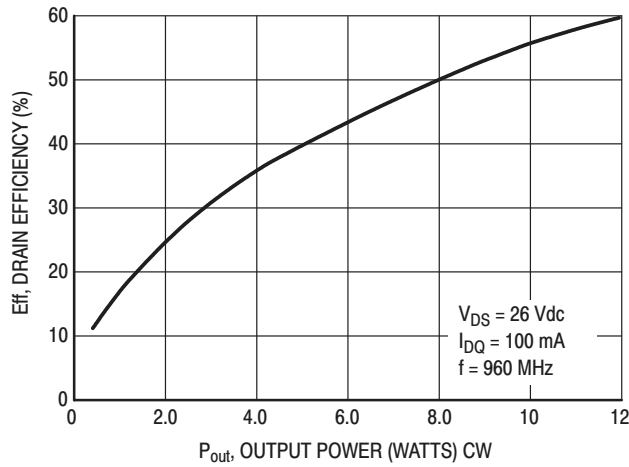


Figure 3. Drain Efficiency versus Output Power

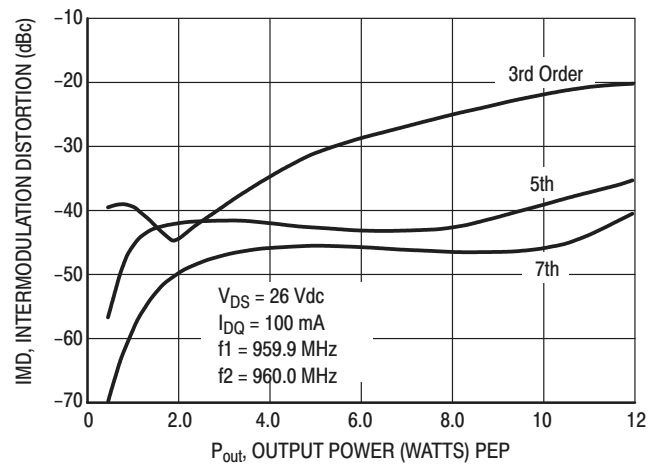
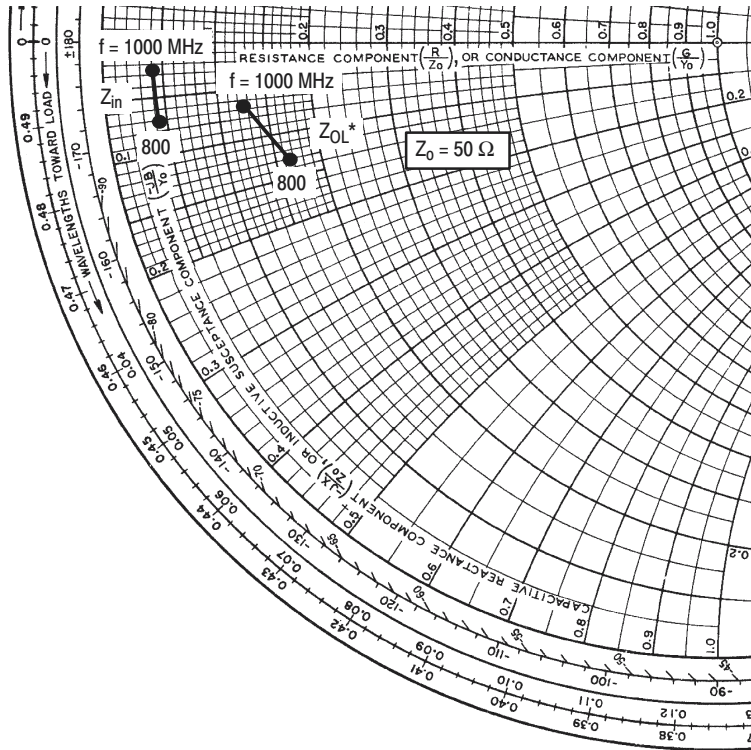


Figure 4. Intermodulation Distortion Products versus Output Power

ARCHIVED 2005



f MHz	Z_{in} Ohms	Z_{OL}^* Ohms
800	$2.20 - j3.00$	$8.50 - j6.20$
825	$2.20 - j2.80$	$8.43 - j6.15$
850	$2.20 - j2.60$	$8.35 - j6.10$
875	$2.20 - j2.40$	$8.28 - j6.08$
900	$2.20 - j2.20$	$8.20 - j6.05$
925	$2.19 - j1.86$	$7.95 - j5.70$
950	$2.13 - j1.68$	$7.50 - j4.75$
975	$2.03 - j1.45$	$6.90 - j3.58$
1000	$2.00 - j1.00$	$6.50 - j3.00$

Z_{in} = Complex conjugate of source impedance.
 Z_{OL}^* = Complex conjugate of the optimum load impedance into which the device operates at a given output power, voltage, current and frequency.

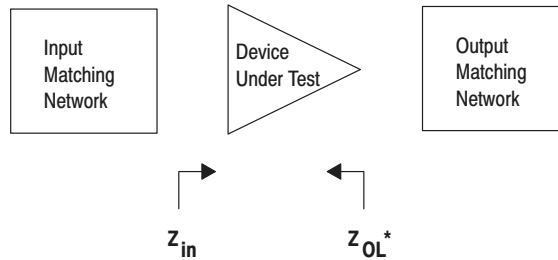


Figure 5. Series Equivalent Input and Output Impedance

Table 1. Common Source S-Parameters at $V_{DS} = 12$ Vdc, $I_D = 100$ mAdc

f GHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	S ₁₁	∠φ	S ₂₁	∠φ	S ₁₂	∠φ	S ₂₂	∠φ
0.500	0.794	-158	2.77	54	0.050	-29	0.720	-150
0.525	0.800	-159	2.61	52	0.049	-32	0.730	-151
0.550	0.807	-160	2.45	49	0.048	-33	0.738	-152
0.575	0.811	-161	2.31	48	0.047	-35	0.746	-153
0.600	0.816	-162	2.18	46	0.046	-37	0.755	-154
0.625	0.822	-163	2.06	44	0.045	-38	0.763	-155
0.650	0.826	-164	1.95	42	0.043	-40	0.770	-156
0.675	0.832	-165	1.85	40	0.042	-41	0.779	-157
0.700	0.836	-166	1.75	39	0.041	-41	0.785	-158
0.725	0.841	-166	1.66	37	0.040	-42	0.793	-159
0.750	0.846	-167	1.58	35	0.039	-44	0.800	-160
0.775	0.851	-168	1.51	34	0.038	-45	0.805	-161
0.800	0.855	-168	1.44	32	0.037	-46	0.812	-162
0.825	0.858	-169	1.37	31	0.036	-47	0.818	-163
0.850	0.863	-170	1.31	29	0.035	-48	0.824	-164
0.875	0.866	-171	1.25	28	0.034	-49	0.830	-165
0.900	0.869	-172	1.20	27	0.033	-50	0.835	-166
0.925	0.872	-172	1.15	25	0.031	-51	0.840	-166
0.950	0.876	-173	1.10	24	0.030	-52	0.846	-167
0.975	0.879	-174	1.06	23	0.029	-52	0.850	-168
1.000	0.882	-174	1.02	22	0.028	-53	0.853	-169

Table 2. Common Source S-Parameters at $V_{DS} = 12$ Vdc, $I_D = 250$ mAdc

f GHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	S ₁₁	∠φ	S ₂₁	∠φ	S ₁₂	∠φ	S ₂₂	∠φ
0.500	0.784	-164	3.49	59	0.041	-22	0.690	-158
0.525	0.789	-165	3.29	57	0.040	-25	0.697	-159
0.550	0.794	-166	3.11	55	0.040	-26	0.705	-160
0.575	0.798	-167	2.94	53	0.038	-26	0.711	-160
0.600	0.802	-167	2.79	51	0.037	-28	0.719	-161
0.625	0.806	-168	2.65	50	0.037	-30	0.726	-162
0.650	0.811	-169	2.52	48	0.036	-31	0.732	-162
0.675	0.814	-169	2.40	46	0.035	-32	0.740	-163
0.700	0.819	-170	2.28	45	0.034	-32	0.747	-164
0.725	0.823	-171	2.18	43	0.034	-34	0.753	-164
0.750	0.827	-171	2.08	42	0.032	-36	0.760	-165
0.775	0.831	-172	1.99	40	0.032	-36	0.765	-166
0.800	0.834	-172	1.90	39	0.031	-36	0.772	-166
0.825	0.838	-173	1.82	37	0.031	-38	0.778	-167
0.850	0.842	-174	1.74	36	0.029	-38	0.783	-168
0.875	0.845	-174	1.67	35	0.028	-39	0.790	-169
0.900	0.850	-175	1.61	33	0.028	-39	0.797	-169
0.925	0.852	-175	1.54	32	0.027	-41	0.801	-170
0.950	0.854	-176	1.48	31	0.027	-42	0.807	-170
0.975	0.859	-176	1.43	30	0.025	-41	0.810	-171
1.000	0.861	-177	1.38	28	0.025	-42	0.815	-171

Table 3. Common Source S-Parameters at $V_{DS} = 26$ Vdc, $I_D = 100$ mAdc

f GHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	S ₁₁	∠φ	S ₂₁	∠φ	S ₁₂	∠φ	S ₂₂	∠φ
0.500	0.832	-155	4.05	56	0.033	-25	0.687	-135
0.525	0.836	-156	3.81	54	0.033	-27	0.697	-137
0.550	0.841	-157	3.58	51	0.034	-28	0.707	-138
0.575	0.845	-159	3.38	49	0.032	-31	0.718	-140
0.600	0.849	-160	3.19	47	0.031	-32	0.728	-141
0.625	0.853	-161	3.02	45	0.030	-34	0.737	-143
0.650	0.856	-162	2.86	43	0.029	-35	0.746	-144
0.675	0.861	-163	2.71	42	0.028	-37	0.755	-145
0.700	0.865	-164	2.57	40	0.028	-37	0.762	-147
0.725	0.868	-165	2.44	38	0.026	-38	0.771	-148
0.750	0.871	-166	2.32	37	0.025	-40	0.779	-149
0.775	0.875	-166	2.21	35	0.025	-41	0.786	-150
0.800	0.877	-167	2.11	33	0.023	-41	0.793	-151
0.825	0.880	-168	2.02	32	0.022	-43	0.800	-152
0.850	0.884	-169	1.92	30	0.022	-43	0.808	-154
0.875	0.886	-170	1.84	29	0.021	-44	0.815	-155
0.900	0.889	-171	1.76	27	0.020	-43	0.820	-156
0.925	0.892	-171	1.68	26	0.020	-46	0.826	-157
0.950	0.894	-172	1.61	24	0.019	-45	0.832	-158
0.975	0.897	-173	1.55	23	0.018	-47	0.837	-159
1.000	0.899	-173	1.49	22	0.017	-48	0.842	-160

Table 4. Common Source S-Parameters at $V_{DS} = 26$ Vdc, $I_D = 250$ mAdc

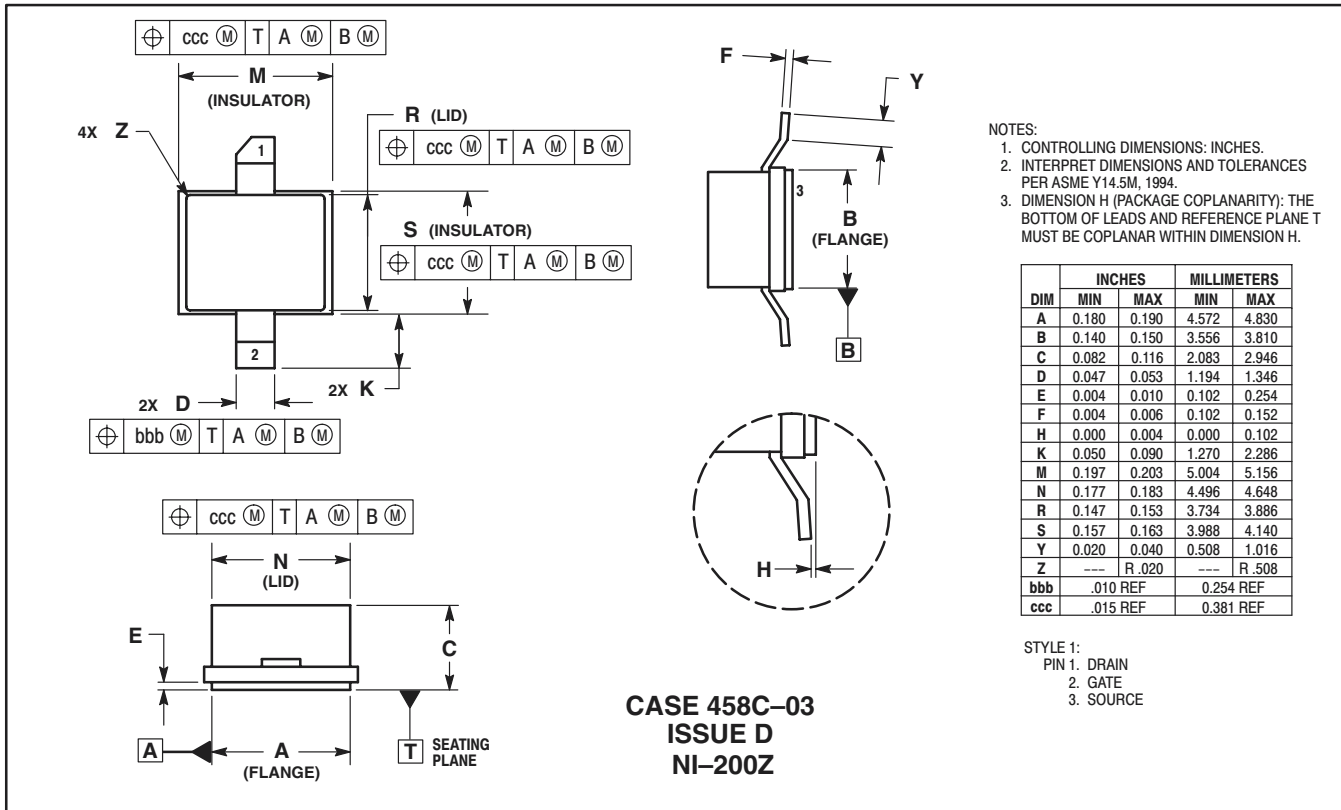
f GHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	S ₁₁	∠φ	S ₂₁	∠φ	S ₁₂	∠φ	S ₂₂	∠φ
0.500	0.824	-160	5.02	59	0.029	-21	0.627	-143
0.525	0.828	-161	4.74	57	0.027	-22	0.638	-144
0.550	0.832	-162	4.47	55	0.026	-22	0.648	-145
0.575	0.835	-163	4.23	53	0.027	-24	0.658	-146
0.600	0.838	-164	4.01	51	0.025	-26	0.669	-147
0.625	0.842	-165	3.81	50	0.025	-26	0.678	-148
0.650	0.844	-166	3.61	48	0.024	-25	0.687	-150
0.675	0.848	-167	3.43	46	0.023	-28	0.697	-150
0.700	0.851	-168	3.27	44	0.023	-30	0.706	-151
0.725	0.855	-168	3.12	43	0.022	-30	0.714	-152
0.750	0.858	-169	2.97	41	0.021	-31	0.723	-153
0.775	0.861	-170	2.84	39	0.021	-31	0.731	-154
0.800	0.863	-170	2.72	38	0.020	-32	0.738	-155
0.825	0.866	-171	2.60	36	0.019	-33	0.746	-156
0.850	0.870	-172	2.49	35	0.018	-34	0.754	-157
0.875	0.871	-173	2.38	33	0.018	-34	0.763	-158
0.900	0.875	-173	2.29	32	0.017	-35	0.768	-159
0.925	0.877	-174	2.20	30	0.016	-36	0.776	-160
0.950	0.879	-175	2.11	29	0.016	-36	0.782	-161
0.975	0.883	-175	2.03	28	0.016	-34	0.787	-161
1.000	0.885	-176	1.95	27	0.015	-34	0.793	-162

Table 5. Common Source S-Parameters at $V_{DS} = 26$ Vdc, $I_D = 500$ mAdc

f GHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	S ₁₁	∠φ	S ₂₁	∠φ	S ₁₂	∠φ	S ₂₂	∠φ
0.500	0.832	-162	5.08	60	0.025	-17	0.612	-145
0.525	0.834	-162	4.80	58	0.025	-20	0.624	-146
0.550	0.838	-164	4.53	56	0.024	-21	0.635	-147
0.575	0.840	-164	4.29	54	0.024	-21	0.644	-148
0.600	0.844	-165	4.07	52	0.023	-23	0.655	-149
0.625	0.847	-166	3.86	50	0.023	-24	0.664	-150
0.650	0.849	-167	3.66	48	0.022	-25	0.673	-151
0.675	0.852	-168	3.48	46	0.021	-27	0.682	-152
0.700	0.856	-169	3.32	45	0.021	-28	0.690	-153
0.725	0.858	-170	3.17	43	0.020	-28	0.701	-154
0.750	0.861	-170	3.02	41	0.019	-30	0.709	-154
0.775	0.864	-171	2.89	40	0.019	-29	0.716	-155
0.800	0.866	-172	2.76	38	0.018	-29	0.723	-156
0.825	0.869	-172	2.65	37	0.017	-29	0.733	-157
0.850	0.872	-173	2.53	35	0.017	-31	0.742	-158
0.875	0.874	-174	2.43	34	0.016	-31	0.751	-159
0.900	0.878	-175	2.33	32	0.015	-31	0.757	-160
0.925	0.879	-175	2.24	31	0.015	-32	0.763	-161
0.950	0.881	-176	2.15	29	0.014	-31	0.770	-161
0.975	0.884	-176	2.07	28	0.014	-31	0.775	-162
1.000	0.886	-177	2.00	27	0.013	-30	0.781	-163

ARCHIVED 2005

PACKAGE DIMENSIONS



ARCHIVED 2005

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation, or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals", must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and the Stylized M Logo are registered in the US Patent & Trademark Office. All other product or service names are the property of their respective owners. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

© Motorola, Inc. 2002.

How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution; P.O. Box 5405, Denver, Colorado 80217. 1-303-675-2140 or 1-800-441-2447

JAPAN: Motorola Japan Ltd.; SPS, Technical Information Center, 3-20-1, Minami-Azabu. Minato-ku, Tokyo 106-8573 Japan. 81-3-3440-3569

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; Silicon Harbour Centre, 2 Dai King Street, Tai Po Industrial Estate, Tai Po, N.T. Hong Kong. 852-26668334

Technical Information Center: 1-800-521-6274

HOME PAGE: <http://www.motorola.com/semiconductors/>

