

HiRel X- Band GaAs Power- MESFET

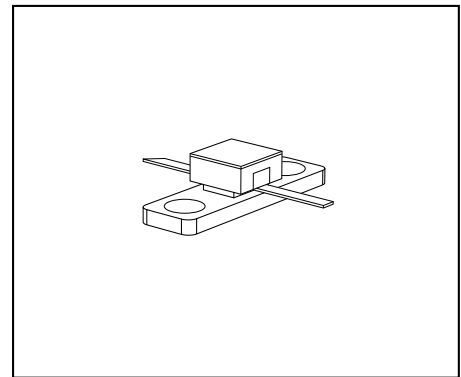
• **HiRel Discrete and Microwave Semiconductor**

- For professional power amplifiers
- For frequencies from 500 MHz to 15 GHz
- Hermetically sealed microwave power package
- Low thermal resistance for high voltage application
- Power adds efficiency > 55%

• **esa Space Qualification Expected 1998**

ESA/SCC Detail Spec. No.: 5614/007

Type Variante No.s 04 to 06



ESD (Electrostatic discharge) sensitive device, observe handling precaution!

Type	Marking	Pin Configuration				Package
		1=G	2=S	3=D	-	
CLX27-00	-	1=G	2=S	3=D	-	MWP-25
CLX27-05	-	1=G	2=S	3=D	-	MWP-25
CLX27-10	-	1=G	2=S	3=D	-	MWP-25

(q) Testing level: P: Professional testing
 H: High Rel quality
 S: Space quality
 ES: ESA qualified

CLX27-nn: specifies output power level (see electrical characteristics)

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	11	V
Drain-gate voltage	V_{DG}	13	
Gate-source voltage	V_{GS}	-6	
Drain current	I_D	420	mA
Gate forward current	I_G	5	
Compression level ¹⁾ Operation Range 1 Operation Range 2 Operation Range 3	P_c	1.5 at $V_{DS} \leq 8V$ 2.5 at $V_{DS} \leq 7V$ 3.5 at $V_{DS} \leq 6V$ 3.5 at $V_{DS} \leq 6V$ tbd.	dB
Junction temperature	T_j	175	
Storage temperature	T_{stg}	-65...175	
Total power dissipation ²⁾	P_{tot}	3.38	W
Soldering temperature ³⁾	T_{sol}	230	°C

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point	R_{thJS}	≤40	K/W

¹⁾Operating Range 1: $80 \text{ mA} \leq I_D \leq 160 \text{ mA}$

Operating Range 2: $I_D > 160 \text{ mA}$

Operating Range 3: $I_D < 80 \text{ mA}$

²⁾At $T_S = 40^\circ\text{C}$. For $T_S > 40^\circ\text{C}$ derating is required.

³⁾During 15 sec. maximum. The same terminal shall not be resoldered until 3 minutes have elapsed

Electrical Characteristics (at $T_A = 25\text{ °C}$; unless otherwise specified)

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Drain- source saturation current $V_{DS} = 2\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	180	300	420	mA
Gate threshold voltage $V_{DS} = 3\text{ V}, I_D = 12\text{ mA}$	$-V_{Gth}$	1.2	2.2	3.2	V
Drain current at pinch-off, low V_{DS} $V_{DS} = 3\text{ V}, V_{GS} = -3.5\text{ V}$	I_{Dp3}	-	-	60	μA
Gate current at pinch-off, low V_{DS} $V_{DS} = 3\text{ V}, V_{GS} = -3.5\text{ V}$	$-I_{Gp3}$	-	-	24	
Drain current at pinch-off, high V_{DS} $V_{DS} = 9.5\text{ V}, V_{GS} = -3.5\text{ V}$	$I_{Dp9.5}$	-	-	600	
Gate current pich-off, high V_{DS} $V_{DS} = 9.5\text{ V}, V_{GS} = -3.5\text{ V}$	$-I_{Gp9.5}$	-	-	240	
Transconductance $V_{DS} = 3\text{ V}, I_D = 120\text{ mA}$	g_m	130	160	-	mS
Thermal resistance junction to soldering point $V_{DS} = 8\text{ V}, I_D = 120\text{ mA}, T_S = 25\text{ °C}$	R_{thJS}	-	35	-	K/W

Electrical Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Linear power gain ¹⁾ $V_{DS} = 8V, I_D = 120\text{ mA}, f = 2,3\text{ GHz}, P_{IN} = 0\text{ dBm}$ CLX27-00 CLX27-05 CLX27-10	G_{Ip}	17.5 18 18	18.5 19 19	- - -	dB
Output power at 1 dB gain compression ¹⁾ $V_{DS} = 8\text{ V}, I_{D(RF\ off)} = 1220\text{ mA}, f = 2.3\text{ GHz}$ CLX27-00 CLX27-05 CLX27-10	P_{1dB}	- - -	26.5 27.3 27.8	- - -	dBm
Output power ¹⁾ $V_{DS} = 8\text{ V}, I_{D(RF\ off)} = 120\text{ mA}, f = 2.3\text{ GHz},$ $P_{IN} = 10.5\text{ dBm}$ CLX27-00 CLX27-05 CLX27-10	P_{OUT}	26 27 27.5	26.5 27.3 27.88	- - -	
Power added efficiency ¹⁾²⁾ $V_{DS} = 8\text{ V}, I_{D(RF\ off)} = 120\text{ mA}, f = 2.3\text{ GHz},$ $P_{IN} = 10.5\text{ dBm}$ CLX27-00 CLX27-05 CLX27-10	PAE	45 48 50	50 53 55	- - -	%

¹RF Power characteristics given for power matching conditions

²Power added efficiency: $PAE = (P_{RFout} - P_{RFin})/P_{DC}$

Typical Common Source S- Parameters
 $V_{DS} = 3\text{ V}, I_D = 15\text{ mA}, Z_0 = 50\ \Omega$

f	S ₁₁		S ₂₁		S ₁₂		S ₂₂		k-Fact.	S ₂₁ /S ₁₂	MAG
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG			
0.5	0.945	-45	8.649	151	0.0266	67	0.136	-85	0.22	25.1	-
0.6	0.928	-52	8.466	145	0.0283	60	0.141	-91	0.27	24.8	-
0.7	0.911	-60	8.254	140	0.0303	55	0.148	-97	0.32	24.4	-
0.8	0.898	-66	8.022	135	0.0327	50	0.156	-104	0.35	23.9	-
0.9	0.886	-73	7.777	131	0.0352	47	0.165	-111	0.37	23.4	-
1	0.875	-80	7.531	126	0.0381	43	0.177	-118	0.39	23	-
1.1	0.867	-87	7.281	122	0.0407	40	0.185	-125	0.4	22.5	-
1.2	0.861	-93	7.028	117	0.0428	37	0.195	-130	0.41	22.2	-
1.3	0.855	-100	6.776	113	0.0448	34	0.204	-135	0.42	21.8	-
1.4	0.849	-106	6.533	109	0.0463	31	0.213	-140	0.43	21.5	-
1.5	0.844	-111	6.298	105	0.0478	29	0.224	-144	0.44	21.2	-
1.6	0.839	-117	6.067	101	0.0493	26	0.232	-148	0.45	20.9	-
1.7	0.834	-122	5.842	98	0.0504	23	0.24	-152	0.47	20.6	-
1.8	0.83	-126	5.628	94	0.0512	20	0.248	-155	0.48	20.4	-
1.9	0.826	-131	5.421	91	0.0518	18	0.256	-158	0.5	20.2	-
2	0.822	-135	5.221	88	0.053	16	0.264	-161	0.52	19.9	-
2.1	0.819	-140	5.027	84	0.0531	14	0.271	-164	0.54	19.8	-
2.2	0.815	-144	4.843	81	0.0537	12	0.278	-167	0.56	19.6	-
2.3	0.812	-147	4.669	78	0.0543	10	0.283	-169	0.58	19.3	-
2.4	0.81	-151	4.506	76	0.0546	8	0.289	-172	0.6	19.2	-
2.5	0.807	-154	4.354	73	0.0548	6	0.293	-174	0.63	19	-
2.6	0.806	-158	4.212	70	0.0553	5	0.296	-177	0.64	18.8	-
2.7	0.804	-161	4.076	67	0.0555	3	0.3	-178	0.67	18.7	-
2.8	0.803	-164	3.948	65	0.0557	2	0.301	180	0.69	18.5	-
2.9	0.802	-167	3.83	62	0.0558	1	0.306	178	0.71	18.4	-
3	0.8	-169	3.717	60	0.0559	-1	0.31	177	0.73	18.2	-
3.1	0.799	-172	3.611	58	0.0559	-2	0.314	175	0.75	18.1	-
3.2	0.799	-175	3.509	55	0.056	-3	0.319	174	0.77	18	-
3.3	0.797	-177	3.41	53	0.0562	-4	0.323	172	0.79	17.8	-
3.4	0.796	-180	3.315	51	0.055	-5	0.326	170	0.84	17.8	-
3.5	0.795	178	3.227	48	0.0562	-7	0.329	168	0.85	17.6	-

Typical Common Source S- Parameters
 $V_{DS} = 3\text{ V}, I_D = 15\text{ mA}, Z_0 = 50\ \Omega$

f GHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂		k-Fact.	S ₂₁ /S ₁₂	MAG
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	dB	dB
4	0.794	165	2.883	37	0.0564	-13	0.344	163	0.93	17.1	-
4.5	0.793	157	2.574	27	0.0567	-18	0.36	157	1.01	16.6	15.8
5	0.793	147	2.32	18	0.0567	-23	0.374	151	1.11	16.1	14.1
5.5	0.792	139	2.123	9	0.0571	-26	0.387	146	1.21	15.7	12.9
6	0.791	131	1.95	2	0.0574	-29	0.402	141	1.3	15.3	12
6.5	0.791	123	1.805	-8	0.0585	-32	0.415	136	1.36	14.9	11.3
7	0.79	116	1.686	-17	0.0601	-35	0.428	130	1.41	14.5	10.7
7.5	0.789	108	1.584	-26	0.0623	-38	0.44	125	1.44	14.1	10.1
8	0.788	100	1.493	-35	0.0646	-40	0.452	118	1.47	13.6	9.6
8.5	0.788	92	1.394	-44	0.0675	-43	0.464	111	1.5	13.1	9
9	0.787	84	1.34	-53	0.07	-47	0.473	103	1.51	12.8	8.6
9.5	0.786	76	1.275	-62	0.0734	-52	0.488	96	1.5	12.4	8.2
10	0.784	68	1.217	-71	0.0772	-56	0.501	89	1.48	12	7.9
10.5	0.78	61	1.166	-80	0.0817	-61	0.512	83	1.47	11.5	7.5
11	0.776	54	1.121	-89	0.0867	-66	0.524	77	1.43	11.1	7.2
11.5	0.77	47	1.083	-97	0.0924	-71	0.534	71	1.39	10.7	7
12	0.757	39	1.052	-106	0.0995	-76	0.539	66	1.38	10.2	6.6
12.5	0.739	32	1.03	-115	0.1082	-82	0.541	60	1.37	9.8	6.2
13	0.715	24	1.012	-125	0.1156	-89	0.541	55	1.39	9.4	5.7
13.5	0.69	15	0.995	-135	0.1245	-97	0.538	49	1.4	9	5.3
14	0.666	5	0.982	-144	0.1384	-104	0.526	42	1.4	8.5	4.7
14.5	0.641	-6	0.971	-154	0.154	-113	0.51	34	1.4	8	4.2
15	0.619	-19	0.97	-165	0.1713	-122	0.489	25	1.37	7.5	3.9
15.5	0.599	-33	0.96	-177	0.1915	-133	0.466	16	1.35	7	3.5
16	0.585	-48	0.955	172	0.2144	-145	0.442	5	1.31	6.5	3.2
16.5	0.583	-63	0.952	160	0.2376	-157	0.415	-9	1.25	6	3
17	0.592	-76	0.945	151	0.266	-166	0.402	-24	1.19	5.5	2.9
17.5	0.613	-88	0.95	142	0.2967	-175	0.4	-36	1.07	5.1	3.4
18	0.636	-98	0.966	134	0.3244	179	0.408	-46	0.98	4.7	-

Typical Common Source S- Parameters
 $V_{DS} = 5V, I_D = 120 \text{ mA}, Z_0 = 50 \Omega$

f	S ₁₁		S ₂₁		S ₁₂		S ₂₂		k-Fact.	S ₂₁ /S ₁₂	MAG
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	dB	dB
0.5	0.946	-45	9.316	152	0.0205	62	0.257	-29	0.28	26.6	-
0.6	0.931	-51	9.124	146	0.0219	58	0.254	-36	0.33	26.2	-
0.7	0.914	-58	8.903	141	0.0234	55	0.249	-43	0.38	25.8	-
0.8	0.898	-65	8.66	136	0.0252	51	0.243	-49	0.42	25.4	-
0.9	0.887	-71	8.404	131	0.0273	47	0.238	-55	0.43	24.9	-
1	0.879	-78	8.15	126	0.0293	44	0.233	-61	0.44	24.4	-
1.1	0.872	-85	7.888	122	0.0314	41	0.228	-66	0.45	24	-
1.2	0.865	-91	7.628	117	0.0332	38	0.224	-72	0.45	23.6	-
1.3	0.859	-98	7.367	113	0.035	35	0.22	-77	0.46	23.2	-
1.4	0.854	-104	7.11	109	0.0361	33	0.218	-82	0.48	22.9	-
1.5	0.849	-109	6.862	105	0.037	30	0.216	-87	0.49	22.7	-
1.6	0.844	-115	6.615	101	0.0382	27	0.215	-92	0.51	22.4	-
1.7	0.839	-120	6.374	97	0.0391	25	0.215	-96	0.52	22.1	-
1.8	0.835	-125	6.144	94	0.0395	23	0.215	-101	0.55	21.9	-
1.9	0.831	-129	5.922	90	0.0401	20	0.216	-105	0.57	21.7	-
2	0.826	-133	5.708	87	0.0402	18	0.217	-110	0.6	21.5	-
2.1	0.823	-138	5.501	84	0.0404	16	0.217	-114	0.63	21.3	-
2.2	0.82	-142	5.304	80	0.0405	14	0.219	-117	0.66	21.2	-
2.3	0.817	-145	5.12	77	0.041	12	0.221	-120	0.68	21	-
2.4	0.814	-149	4.944	74	0.0411	11	0.223	-123	0.71	20.8	-
2.5	0.812	-152	4.783	71	0.042	9	0.226	-125	0.72	20.6	-
2.6	0.811	-156	4.628	69	0.0413	8	0.228	-128	0.76	20.5	-
2.7	0.809	-159	4.48	66	0.0415	6	0.231	-130	0.79	20.3	-
2.8	0.808	-162	4.336	63	0.0418	5	0.234	-133	0.81	20.2	-
2.9	0.807	-165	4.206	61	0.0422	4	0.239	-135	0.82	20	-
3	0.805	-168	4.079	58	0.0422	3	0.242	-137	0.85	19.9	-
3.1	0.804	-170	3.958	56	0.0422	2	0.245	-140	0.88	19.7	-
3.2	0.804	-173	3.845	53	0.043	1	0.249	-142	0.89	19.5	-
3.3	0.803	-176	3.737	51	0.0425	0	0.253	-144	0.92	19.4	-
3.4	0.803	-178	3.632	48	0.0424	-1	0.258	-146	0.95	19.3	-
3.5	0.802	180	3.537	46	0.0423	-2	0.263	-147	0.98	19.2	-

Typical Common Source S- Parameters
 $V_{DS} = 5V, I_D = 120\text{ mA}, Z_0 = 50\ \Omega$

f GHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂		k-Fact.	S ₂₁ /S ₁₂	MAG
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	dB	dB
4	0.801	167	3.12	35	0.0423	-6	0.286	-156	1.09	18.7	16.8
4.5	0.8	157	2.776	24	0.0423	-10	0.309	-165	1.22	18.2	15.4
5	0.799	149	2.494	12	0.0423	-12	0.333	-173	1.33	17.7	14.2
5.5	0.798	140	2.258	4	0.0429	-14	0.357	-181	1.44	17.2	13.3
6	0.798	132	2.068	-6	0.044	-15	0.381	169	1.51	16.7	12.5
6.5	0.797	124	1.907	-16	0.0461	-16	0.404	162	1.54	16.2	11.8
7	0.796	117	1.772	-25	0.0484	-18	0.424	155	1.56	15.6	11.2
7.5	0.796	109	1.656	-34	0.0518	-20	0.444	148	1.53	15	10.7
8	0.795	101	1.554	-42	0.0553	-22	0.463	141	1.51	14.5	10.3
8.5	0.794	93	1.463	-51	0.0591	-25	0.481	132	1.49	13.9	9.8
9	0.793	85	1.381	-60	0.0633	-29	0.5	124	1.45	13.4	9.4
9.5	0.793	77	1.308	-69	0.0679	-33	0.517	116	1.41	12.8	9
10	0.793	69	1.241	-78	0.0727	-38	0.536	108	1.35	12.3	8.8
10.5	0.792	61	1.182	-87	0.0783	-43	0.557	100	1.27	11.8	8.6
11	0.792	54	1.127	-96	0.0842	-49	0.577	93	1.19	11.3	8.6
11.5	0.79	47	1.08	-105	0.0907	-54	0.594	86	1.11	10.8	8.7
12	0.778	40	1.041	-114	0.0987	-60	0.607	80	1.07	10.2	8.6
12.5	0.761	32	1.005	-123	0.1085	-67	0.618	74	1.04	9.7	8.4
13	0.738	23	0.981	-132	0.1195	-75	0.623	68	1.03	9.1	8.1
13.5	0.714	15	0.957	-142	0.131	-82	0.625	61	1.03	8.6	7.6
14	0.695	5	0.941	-151	0.1445	-91	0.621	54	1.02	8.1	7.3
14.5	0.666	-7	0.929	-161	0.1623	-100	0.612	46	1.02	7.6	6.7
15	0.641	-20	0.917	-172	0.1824	-110	0.598	38	1.02	7	6.1
15.5	0.62	-34	0.908	176	0.2049	-121	0.581	29	1.01	6.5	5.9
16	0.604	-48	0.9	165	0.23	-134	0.561	18	0.99	5.9	-
16.5	0.604	-63	0.898	153	0.262	-147	0.539	5	0.93	5.3	-
17	0.62	-77	0.9	145	0.2891	-157	0.526	-8	0.89	4.9	-
17.5	0.643	-89	0.908	135	0.3231	-165	0.526	-19	0.8	4.5	-
18	0.667	-98	0.923	127	0.3541	-172	0.537	-28	0.72	4.2	-

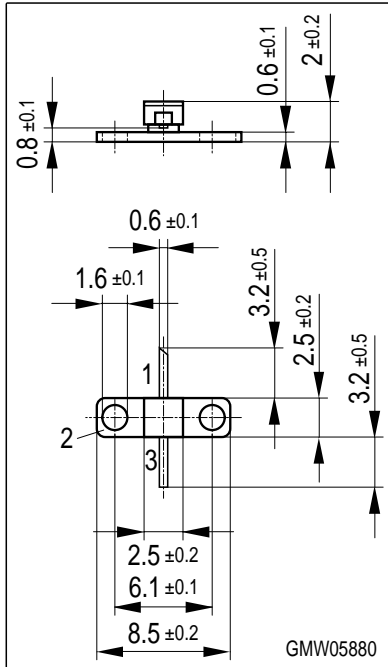
Typical Common Source S- Parameters
 $V_{DS} = 8V, I_D = 120\text{ mA}, Z_0 = 50\ \Omega$

f	S ₁₁		S ₂₁		S ₁₂		S ₂₂		k-Fact.	S ₂₁ /S ₁₂	MAG
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	dB	dB
0.5	0.95	-44	9.344	149	0.0135	65	0.404	-21	0.33	28.4	-
0.6	0.932	-52	9.149	143	0.0156	61	0.398	-26	0.39	27.7	-
0.7	0.915	-58	8.924	139	0.0176	57	0.39	-29	0.44	27.1	-
0.8	0.902	-65	8.677	135	0.0197	53	0.381	-33	0.46	26.4	-
0.9	0.891	-72	8.42	130	0.021	49	0.373	-37	0.49	26	-
1	0.881	-79	8.166	125	0.0225	46	0.365	-41	0.51	25.6	-
1.1	0.874	-85	7.908	121	0.024	42	0.357	-45	0.52	25.2	-
1.2	0.868	-92	7.648	116	0.0253	39	0.35	-48	0.53	24.8	-
1.3	0.862	-98	7.387	112	0.0265	36	0.343	-52	0.54	24.5	-
1.4	0.857	-104	7.132	108	0.0274	33	0.338	-55	0.56	24.2	-
1.5	0.852	-110	6.882	104	0.0281	30	0.333	-59	0.58	23.9	-
1.6	0.848	-115	6.632	100	0.0286	28	0.328	-62	0.6	23.7	-
1.7	0.843	-120	6.389	96	0.0293	25	0.324	-66	0.62	23.4	-
1.8	0.839	-125	6.155	92	0.0297	23	0.32	-69	0.65	23.2	-
1.9	0.836	-130	5.928	89	0.0302	21	0.318	-72	0.67	22.9	-
2	0.832	-134	5.711	85	0.0304	19	0.317	-75	0.7	22.7	-
2.1	0.829	-138	5.505	82	0.0306	17	0.315	-79	0.73	22.6	-
2.2	0.827	-142	5.309	79	0.0307	16	0.314	-82	0.76	22.4	-
2.3	0.825	-146	5.125	75	0.031	15	0.312	-85	0.79	22.2	-
2.4	0.823	-149	4.953	72	0.0313	14	0.311	-88	0.81	22	-
2.5	0.821	-153	4.792	69	0.0313	12	0.311	-91	0.85	21.8	-
2.6	0.82	-156	4.634	66	0.0313	11	0.311	-94	0.88	21.7	-
2.7	0.819	-159	4.486	64	0.0316	10	0.313	-96	0.9	21.5	-
2.8	0.818	-162	4.342	61	0.0314	9	0.315	-99	0.94	21.4	-
2.9	0.817	-165	4.206	58	0.0314	8	0.317	-101	0.97	21.3	-
3	0.815	-168	4.076	56	0.0315	7	0.319	-104	1	21.1	20.9
3.1	0.815	-171	3.956	53	0.0315	6	0.321	-107	1.03	21	19.9
3.2	0.814	-173	3.841	50	0.0315	5	0.325	-110	1.06	20.9	19.3
3.3	0.813	-176	3.731	48	0.0315	4	0.327	-113	1.1	20.7	18.8
3.4	0.813	-178	3.629	45	0.0315	4	0.33	-115	1.12	20.6	18.5
3.5	0.812	179	3.534	43	0.0315	3	0.334	-118	1.15	20.5	18.1

Typical Common Source S- Parameters
 $V_{DS} = 8V, I_D = 120 \text{ mA}, Z_0 = 50 \Omega$

f GHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂		k-Fact.	S ₂₁ /S ₁₂	MAG
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	MAG	dB	dB
4	0.812	168	3.11	32	0.0314	1	0.353	-131	1.29	20	16.7
4.5	0.812	158	2.748	20	0.0315	1	0.378	-143	1.42	19.4	15.5
5	0.812	148	2.463	10	0.0322	1	0.403	-154	1.53	18.8	14.5
5.5	0.812	140	2.223	2	0.0339	1	0.428	-164	1.58	18.2	13.7
6	0.811	132	2.025	-8	0.0364	1	0.45	-173	1.58	17.5	13
6.5	0.811	122	1.86	-20	0.0398	1	0.474	179	1.53	16.7	12.4
7	0.811	116	1.721	-28	0.043	0	0.498	171	1.49	16	11.9
7.5	0.811	108	1.601	-37	0.0478	-2	0.519	163	1.4	15.3	11.5
8	0.811	100	1.496	-47	0.0528	-6	0.538	154	1.32	14.5	11.1
8.5	0.81	92	1.402	-57	0.0581	-11	0.556	145	1.25	13.8	10.8
9	0.81	84	1.317	-66	0.0637	-16	0.574	136	1.17	13.2	10.6
9.5	0.809	76	1.24	-76	0.0692	-21	0.595	127	1.1	12.5	10.6
10	0.809	68	1.171	-85	0.0759	-27	0.614	118	1.02	11.9	10.9
10.5	0.808	60	1.109	-94	0.0828	-33	0.635	110	0.94	11.3	-
11	0.806	53	1.052	-104	0.0902	-39	0.656	102	0.86	10.7	-
11.5	0.802	46	1.002	-112	0.0978	-45	0.674	94	0.79	10.1	-
12	0.793	38	0.959	-121	0.1066	-51	0.688	88	0.75	9.5	-
12.5	0.778	30	0.926	-130	0.1169	-58	0.698	81	0.72	9	-
13	0.756	22	0.891	-140	0.129	-66	0.706	75	0.71	8.4	-
13.5	0.735	13	0.863	-149	0.14	-74	0.709	67	0.72	7.9	-
14	0.713	3	0.842	-158	0.1568	-82	0.711	60	0.71	7.3	-
14.5	0.691	-9	0.825	-168	0.1759	-92	0.708	52	0.7	6.7	-
15	0.665	-22	0.81	-179	0.1975	-103	0.699	44	0.71	6.1	-
15.5	0.639	-36	0.8	169	0.2214	-115	0.688	34	0.73	5.6	-
16	0.622	-51	0.793	158	0.2474	-128	0.673	23	0.73	5.1	-
16.5	0.622	-66	0.787	146	0.2765	-142	0.657	11	0.71	4.5	-
17	0.642	-80	0.787	137	0.3148	-152	0.648	-2	0.65	4	-
17.5	0.668	-92	0.794	128	0.353	-161	0.652	-13	0.58	3.5	-
18	0.694	-101	0.808	121	0.3881	-167	0.667	-22	0.51	3.2	-

MWP-25 Package



Edition 2006-02-01

Published by

Infineon Technologies AG

81726 München, Germany

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