

Sonnenschein A400



Technical data sheet

Technical features:

- Nominal capacity 20 -180 Ah C₁₀
- Exceptional energy storage capacity combined with long life
- Thick grid plates with high quality lead calcium alloy, for enhanced corrosion resistance and stability
- Very low gassing due to the internal gas recombination
- Shelf life up to 2 years at 20 °C without recharge due to the very low self discharge rate

Standards & certifications:

- EUROBAT 2015 classification: >12 years – very long life
- Designed in accordance with IEC 60896-21/22
- Trouble-free transportation without restrictions for most rail, road, sea, and air transport (IATA, DGR clause A67)
- Manufactured in Europe in our ISO 9001 certified production facilities
- Approval: UL (Underwriters Laboratories, USA), DNV GL (Germanischer Lloyd), DIN-GOST TÜV (Russia)



Design life
15 years for
blocks $\geq$ 20 Ah,



Nominal capacity
20 -180 Ah C₁₀



Block battery



Grid plate



Recyclable



Valve regulated
lead-acid
batteries



Proof against
deep discharge



Maintenance free
(no topping up)

Container, terminal and torque

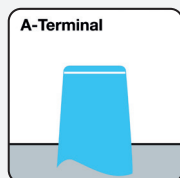
20-180 Ah = Polypropylene (PP)



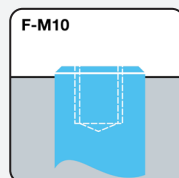
5 Nm



6 Nm



8 Nm



17 Nm

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Technical data sheet

Technical characteristics and data

Type	Part number	Nom. voltage	Nominal capacity	Length	Width	Height	Height	Weight*	Internal resistance	Short circuit current	Terminal
		V	C ₁₀ 1.80 Vpc 20 °C	(l)	(w)	(h1)	(h2)	approx. kg	mOhm	A	
			Ah	max. mm	max. mm	max. mm	max. mm				
A406/165 A	NGA4060165HS0CA	6	165	246	192	254	275	28.0	2.10	2800	A-Terminal
A406/165 F10	NGA4060165HS0FA	6	165	246	192	254	282	28.5	2.10	2800	F-M10
A412/20 G5	NGA4120020HS0BA	12	20.0	167	176	126	126	9.00	25.0	460	G-M5
A412/32 G6	NGA4120032HS0BA	12	32.0	210	175	175	175	13.6	15.0	784	G-M6
A412/32 F10	NGA4120032HS0FA	12	32.0	210	175	175	181	14.1	15.0	784	F-M10
A412/50 A	NGA4120050HS0CA	12	50.0	278	175	190	190	18.5	10.0	1220	A-Terminal
A412/50 F10	NGA4120050HS0FA	12	50.0	278	175	190	196	19.0	10.0	1220	F-M10
A412/50 G6	NGA4120050HS0BA	12	50.0	278	175	190	190	18.5	10.0	1220	G-M6
A412/65 F10	NGA4120065HS0FA	12	65.0	353	175	190	196	23.5	9.00	1414	F-M10
A412/65 G6	NGA4120065HS0BA	12	65.0	353	175	190	190	23.0	9.00	1414	G-M6
A412/90 A	NGA4120090HS0CA	12	90.0	286	269	208	230	33.0	7.00	1733	A-Terminal
A412/90 F10	NGA4120090HS0FA	12	90.0	286	269	208	234	33.5	7.00	1733	F-M10
A412/100 A	NGA4120100HS0CA	12	100	513	189	195	219	36.5	6.90	1777	A-Terminal
A412/100 F10	NGA4120100HS0FA	12	100	513	189	195	223	37.0	6.90	1777	F-M10
A412/120 A	NGA4120120HS0CA	12	120	513	223	195	219	45.0	5.70	2118	A-Terminal
A412/120 F10	NGA4120120HS0FA	12	120	513	223	195	223	45.5	5.70	2118	F-M10
A412/180 A	NGA4120180HS0CA	12	180	518	274	216	238	63.0	3.80	3227	A-Terminal
A412/180 F10	NGA4120180HS0FA	12	180	518	274	216	244	63.5	3.80	3227	F-M10

h2 for F10 terminals plus max. 24 mm for connector/screw.

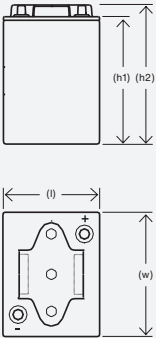
* Actual weight may differ by ±5%

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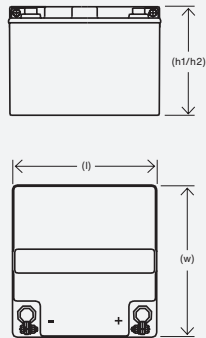
Technical data sheet

Drawings

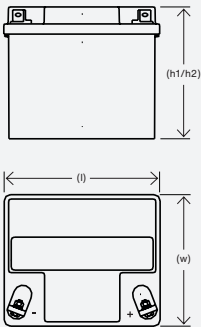
A406/165 A
(A406/165 F10)*



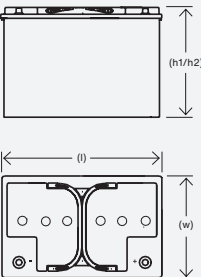
A412/20 G5



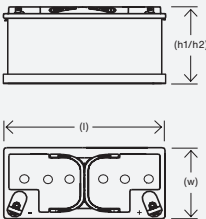
A412/32 F10
(A412/32 G6)*



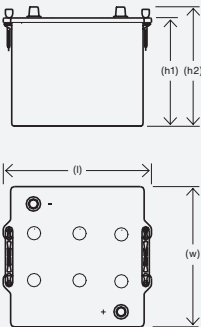
A412/50 A
(A412/50 G6, A412/50 F10)*



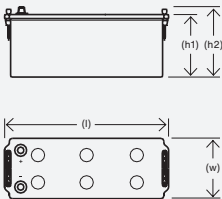
A412/65 F10
(A412/65 G6)*



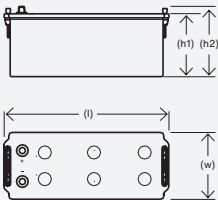
A412/90 A
(A412/90 F10)*



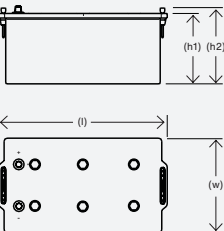
A412/100 A
(A412/100 F10)*



A412/120 A
(A412/120 F10)*



A412/180 A
(A412/180 F10)*



Not to scale!

* Dimensions are also valid for other terminals.

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Constant current discharge

Type	Part number	5 min	10 min	15 min	20 min	30 min	45 min	1 h	2 h	3 h	4 h	5 h	8 h	10 h	24 h
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1.85 Vpc – Discharge in A at 20 °C

A406/165A	NGA4060165HS0CA	175	153	143	131	115	98.0	82.0	53.0	41.0	32.4	27.0	18.1	15.9	7.00
A412/20G5	NGA4120020HS0BA	43.4	33.5	27.9	24.3	18.9	15.5	12.7	7.36	5.52	4.32	3.59	2.38	2.00	0.97
A412/32G6	NGA4120032HS0BA	63.6	51.6	39.7	38.4	31.6	23.7	19.2	11.4	8.32	6.84	5.71	3.83	3.20	1.25
A412/50A	NGA4120050HS0CA	86.2	72.4	62.3	55.5	45.9	35.3	28.9	18.6	12.8	10.2	8.51	5.71	4.80	1.94
A412/65G6	NGA4120065HS0BA	127	94.7	76.2	70	59.5	49.4	39.3	23.1	16.7	13.4	11.3	7.60	6.50	2.77
A412/90A	NGA4120090HS0CA	136	117	99.8	88.9	71.5	55.2	45.7	30.2	22.8	17.6	14.8	10.4	8.90	3.90
A412/100A	NGA4120100HS0CA	157	134	115	104	84.8	66.0	53.1	34.6	23.8	18.6	15.7	10.8	9.60	4.23
A412/120A	NGA4120120HS0CA	170	155	140	121	95.1	75.8	60.0	39.8	28.1	22.4	19.4	14.0	12.0	5.50
A412/180A	NGA4120180HS0CA	282	240	211	188	152	122	100	63.1	45.3	34.8	29.5	19.8	18.0	7.50

1.80 Vpc – Discharge in A at 20 °C

A406/165A	NGA4060165HS0CA	211	200	180	158	132	109	88.0	56.0	43.0	33.9	28.2	18.8	16.5	7.00
A412/20G5	NGA4120020HS0BA	45.0	39.6	31.5	26.1	19.8	15.6	12.9	7.45	5.52	4.42	3.59	2.38	2.00	1.00
A412/32G6	NGA4120032HS0BA	75.6	61.2	46.4	43.2	33.9	26.0	21.5	12.2	8.83	7.21	5.99	4.02	3.20	1.25
A412/50A	NGA4120050HS0CA	104	86.5	72.1	62.7	50.6	38.9	30.3	19.6	13.3	10.6	8.78	5.89	5.00	2.11
A412/65G6	NGA4120065HS0BA	145	115	92.7	78.1	64.0	52.2	40.8	24.2	17.5	14.0	11.6	7.70	6.50	2.77
A412/90A	NGA4120090HS0CA	166	142	118	99.9	79.2	61.1	49.7	31.7	23.5	18.3	15.5	10.8	9.00	4.00
A412/100A	NGA4120100HS0CA	189	160	133	115	94.3	73.5	58.4	36.0	25.8	19.4	16.4	11.3	10.0	4.23
A412/120A	NGA4120120HS0CA	237	185	155	130	102	83.2	67.0	41.9	30.0	23.7	20.1	14.0	12.0	5.50
A412/180A	NGA4120180HS0CA	340	282	244	216	168	133	109	66.1	48.2	36.0	30.6	20.4	18.0	7.50

1.75 Vpc – Discharge in A at 20 °C

A406/165A	NGA4060165HS0CA	250	226	210	180	143	115	92.0	58.0	43.7	34.4	28.5	19.1	16.6	7.00
A412/20G5	NGA4120020HS0BA	57.7	43.6	33.5	27.7	20.7	16.5	13.4	7.64	5.52	4.46	3.68	2.38	2.00	1.02
A412/32G6	NGA4120032HS0BA	87.6	68.4	50.8	46.8	35.0	27.1	22.0	12.3	8.92	7.36	6.07	4.05	3.20	1.25
A412/50A	NGA4120050HS0CA	116	97.5	79.4	67.8	52.8	40.3	31.6	19.6	13.5	10.7	8.88	5.95	5.00	2.16
A412/65G6	NGA4120065HS0BA	163	130	103	85.4	67.8	54.7	42.6	25.2	17.9	14.3	11.9	7.70	6.50	2.79
A412/90A	NGA4120090HS0CA	186	154	128	108	84.0	64.5	51.8	32.8	24.1	18.8	15.8	11.0	9.00	4.00
A412/100A	NGA4120100HS0CA	215	180	146	125	99.5	76.5	61.0	36.9	26.5	19.7	16.6	11.4	10.0	4.50
A412/120A	NGA4120120HS0CA	243	195	161	133	104	85.0	68.0	42.6	30.7	23.7	20.1	14.0	12.0	5.50
A412/180A	NGA4120180HS0CA	384	323	270	236	178	141	114	67.3	49.4	36.5	31.1	20.7	18.0	7.50

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Constant current discharge

Type	Part number	5 min	10 min	15 min	20 min	30 min	45 min	1 h	2 h	3 h	4 h	5 h	8 h	10 h	24 h
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1.70 Vpc – Discharge in A at 20 °C

A406/165A	NGA4060165HS0CA	280	253	233	198	152	119	93.9	58.0	43.9	34.6	28.7	19.1	16.6	7.00
A412/20G5	NGA4120020HS0BA	60.3	45.6	35.1	27.9	20.7	16.6	13.5	7.73	5.61	4.46	3.68	2.38	2.00	1.02
A412/32G6	NGA4120032HS0BA	101	73.2	55.2	50.4	37.1	28.3	22.4	12.3	9.04	7.42	6.09	4.02	3.20	1.25
A412/50A	NGA4120050HS0CA	130	102	83.7	71.1	53.9	41.3	32.2	19.5	13.5	10.7	8.92	6.00	5.00	2.19
A412/65G6	NGA4120065HS0BA	180	134	109	89.1	70.1	55.9	43.6	25.2	18.1	14.4	11.9	7.80	6.50	2.79
A412/90A	NGA4120090HS0CA	206	164	137	113	86.9	66.2	52.7	33.2	24.3	18.9	16.3	11.0	9.00	4.00
A412/100A	NGA4120100HS0CA	227	196	157	131	103	78.2	62.3	37.6	26.9	19.9	17.0	11.6	10.0	4.50
A412/120A	NGA4120120HS0CA	278	200	165	136	107	87.1	68.5	42.6	30.7	23.7	20.1	14.0	12.0	5.50
A412/180A	NGA4120180HS0CA	406	352	294	253	187	145	116	68,1	50,1	36,8	31,3	20,8	18,0	7,50

1.65 Vpc – Discharge in A at 20 °C

A406/165A	NGA4060165HS0CA	290	270	245	210	157	121	95.0	59.0	43.9	34.6	28.7	19.1	16.6	7.00
A412/20G5	NGA4120020HS0BA	61.2	46.7	36.5	28.4	21.0	16.6	13.7	7.73	5.61	4.46	3.68	2.38	2.00	1.03
A412/32G6	NGA4120032HS0BA	113	78.0	57.4	51.6	38.3	28.3	22.4	12.3	9.13	7.50	6.15	4.02	3.20	1.25
A412/50A	NGA4120050HS0CA	145	113	88.7	72.5	55.0	41.1	32.5	19.6	13.6	10.8	8.90	6.00	5.00	2.21
A412/65G6	NGA4120065HS0BA	196	138	112	92.3	70.7	55.9	44.1	25.2	18.2	14.4	12.0	7.80	6.50	2.81
A412/90A	NGA4120090HS0CA	225	172	142	117	88.4	67.0	53.3	33.5	24.5	19.0	16.3	11.0	9.00	4.00
A412/100A	NGA4120100HS0CA	248	207	164	134	103	78.8	63.1	37.7	27.1	20.0	17.0	11.6	10.0	4.50
A412/120A	NGA4120120HS0CA	295	210	170	142	110	88.0	69.0	42.6	30.7	23.7	20.1	14.0	12.0	5.50
A412/180A	NGA4120180HS0CA	442	375	314	267	192	147	117	68.4	50.8	37.2	31.6	20.9	18.0	7.50

1.60 Vpc – Discharge in A at 20 °C

A406/165A	NGA4060165HS0CA	300	275	250	215	160	122	96.0	59.0	44.0	34.6	28.7	19.1	16.6	7.00
A412/20G5	NGA4120020HS0BA	64.3	47.3	36.8	28.7	21.2	16.6	13.7	7.73	5.61	4.46	3.68	2.38	2.00	1.04
A412/32G6	NGA4120032HS0BA	121	81.6	59.6	52.8	38.3	28.3	22.4	12.4	9.14	7.50	6.15	4.02	3.20	1.25
A412/50A	NGA4120050HS0CA	150	116	90.1	72.9	55.5	41.5	32.5	19.6	13.6	10.9	8.90	6.00	5.00	2.22
A412/65G6	NGA4120065HS0BA	207	143	113	93.5	71.3	55.9	44.1	25.3	18.2	14.4	12.0	7.80	6.50	2.83
A412/90A	NGA4120090HS0CA	245	177	145	119	89.3	67.6	53.6	33.5	24.5	19.0	16.3	11.0	9.00	4.00
A412/100A	NGA4120100HS0CA	270	214	169	136	105	80.0	63.3	37.7	27.2	20.0	17.2	11.7	10.0	4.50
A412/120A	NGA4120120HS0CA	300	225	175	146	111	88.5	69.5	42.6	30.7	23.7	20.1	14.0	12.0	5.50
A412/180A	NGA4120180HS0CA	487	396	326	273	196	148	117	68.5	50.9	37.2	31.6	20.9	18.0	7.50

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Constant power discharge

Type	Part number	2 min	3 min	5 min	7 min	10 min	15 min	20 min	30 min	45 min	1 h	2 h	3 h	4 h	5 h	8 h	10 h	24 h
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1.85 Vpc – Discharge in W/block at 20 °C

A406/165A	NGA4060165HS0CA	1958	1933	1885	1836	1764	1642	1521	1279	1081	936	639	467	379	324	208	173	74.0
A412/20G5	NGA4120020HS0BA	485	452	389	367	334	284	252	199	161	132	79.2	57.1	46.0	38.4	26.0	21.6	10.2
A412/32G6	NGA4120032HS0BA	747	696	638	585	531	454	403	333	259	213	151	104	81.0	66.0	44.0	36.0	16.0
A412/50A	NGA4120050HS0CA	1092	1074	1002	949	876	730	650	549	412	319	193	139	110	85.0	62.0	49.0	23.0
A412/65G6	NGA4120065HS0BA	1562	1486	1404	1292	1171	1016	887	721	556	462	260	195	162	128	89.3	72.4	31.8
A412/90A	NGA4120090HS0CA	1854	1781	1642	1511	1367	1188	1086	910	717	596	359	266	214	179	128	105	48.0
A412/100A	NGA4120100HS0CA	2154	2061	1918	1778	1621	1384	1194	989	775	607	402	270	239	191	127	110	48.0
A412/120A	NGA4120120HS0CA	2563	2431	2209	2012	1771	1520	1390	1188	962	791	474	340	276	228	157	133	61.0
A412/180A	NGA4120180HS0CA	3474	3323	3152	2997	2714	2314	2070	1609	1287	1107	666	509	392	310	190	160	75.0

1.80 Vpc – Discharge in W/block at 20 °C

A406/165A	NGA4060165HS0CA	2325	2285	2205	2125	2004	1804	1682	1452	1168	1024	674	499	396	335	214	177	76.0
A412/20G5	NGA4120020HS0BA	591	555	484	417	377	322	282	215	170	136	81.0	58.1	47.2	39.8	26.5	22.2	10.4
A412/32G6	NGA4120032HS0BA	909	840	745	683	618	514	443	365	280	232	159	107	84.0	69.0	46.0	38.0	16.0
A412/50A	NGA4120050HS0CA	1316	1269	1134	1040	969	802	715	581	443	340	210	151	115	90.0	65.0	50.0	23.0
A412/65G6	NGA4120065HS0BA	1960	1766	1569	1425	1305	1142	960	784	606	501	287	197	165	132	91.1	74.4	32.7
A412/90A	NGA4120090HS0CA	2133	2033	1877	1709	1533	1302	1167	979	767	642	389	283	222	187	132	110	49.0
A412/100A	NGA4120100HS0CA	2367	2264	2120	1973	1788	1531	1301	1046	791	639	422	280	251	207	130	114	49.0
A412/120A	NGA4120120HS0CA	2958	2787	2509	2299	1974	1696	1490	1238	1010	841	504	358	291	236	163	135	63.0
A412/180A	NGA4120180HS0CA	4109	3898	3605	3379	3051	2628	2308	1809	1419	1203	723	534	409	330	201	162	77.0

1.75 Vpc – Discharge in W/block at 20 °C

A406/165A	NGA4060165HS0CA	2585	2540	2450	2361	2226	2002	1783	1560	1243	1077	691	518	405	342	217	178	77.6
A412/20G5	NGA4120020HS0BA	677	619	541	471	395	339	292	224	171	137	84.4	61.4	47.5	40.2	26.6	22.4	10.4
A412/32G6	NGA4120032HS0BA	1026	943	830	739	649	549	474	385	291	240	164	109	86.0	70.0	48.0	39.0	16.0
A412/50A	NGA4120050HS0CA	1511	1480	1293	1148	1032	858	762	588	459	351	215	152	117	170	65.0	51.0	24.0
A412/65G6	NGA4120065HS0BA	2144	2060	1867	1672	1424	1234	1041	818	610	512	292	199	167	134	91.6	75.0	33.2
A412/90A	NGA4120090HS0CA	2301	2184	1984	1796	1642	1428	1241	1020	795	661	398	288	225	191	133	111	49.0
A412/100A	NGA4120100HS0CA	2773	2624	2374	2159	1946	1645	1375	1069	816	655	444	295	256	213	132	116	49.0
A412/120A	NGA4120120HS0CA	3608	3018	2636	2428	2156	1850	1594	1291	1044	865	512	358	297	244	166	136	64.0
A412/180A	NGA4120180HS0CA	4555	4307	4001	3707	3359	2858	2471	1932	1498	1260	751	538	416	338	205	163	78.0

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Constant power discharge

Type	Part number	2 min	3 min	5 min	7 min	10 min	15 min	20 min	30 min	45 min	1 h	2 h	3 h	4 h	5 h	8 h	10 h	24 h
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1.70 Vpc – Discharge in W/block at 20 °C

A406/165A	NGA4060165HS0CA	2765	2719	2627	2535	2397	2166	1936	1636	1299	1107	700	528	410	346	219	180	78.8
A412/20G5	NGA4120020HS0BA	730	681	606	525	420	360	307	235	172	137	84.6	61.5	48.8	41.4	27.3	23.0	10.7
A412/32G6	NGA4120032HS0BA	1117	1040	904	789	702	590	495	394	299	244	164	110	87.0	70.0	48.0	39.0	16.0
A412/50A	NGA4120050HS0CA	1647	1584	1406	1234	1079	889	789	601	472	356	216	153	117	129	66.0	51.0	24.0
A412/65G6	NGA4120065HS0BA	2356	2234	1983	1803	1511	1291	1073	836	613	528	294	200	168	135	91.8	75.2	33.4
A412/90A	NGA4120090HS0CA	2681	2518	2285	2048	1836	1504	1288	1040	807	669	405	289	229	192	134	112	49.0
A412/100A	NGA4120100HS0CA	3127	2916	2698	2404	2046	1724	1422	1085	826	662	447	315	257	215	132	116	49.0
A412/120A	NGA4120120HS0CA	3857	3536	2997	2664	2391	1969	1697	1340	1073	892	516	362	299	246	167	137	64.0
A412/180A	NGA4120180HS0CA	5090	4837	4354	3980	3522	3124	2602	2002	1542	1291	759	540	419	342	207	164	78.0

1.65 Vpc – Discharge in W/block at 20 °C

A406/165A	NGA4060165HS0CA	2892	2845	2751	2658	2517	2283	2049	1686	1342	1122	705	532	415	351	224	182	79.4
A412/20G5	NGA4120020HS0BA	816	758	634	549	432	364	308	235	172	137	84.7	61.5	48.8	41.5	27.4	23.1	10.7
A412/32G6	NGA4120032HS0BA	1219	1121	962	841	733	609	512	397	302	248	164	110	87.0	71.0	48.0	39.0	16.0
A412/50A	NGA4120050HS0CA	1834	1747	1480	1308	1120	922	804	609	481	358	217	153	118	93.0	66.0	52.0	24.0
A412/65G6	NGA4120065HS0BA	2587	2396	2089	1892	1602	1326	1100	849	617	531	295	200	168	135	91.9	75.4	33.6
A412/90A	NGA4120090HS0CA	2964	2727	2419	2170	1917	1555	1320	1049	813	673	406	290	230	193	134	112	50.0
A412/100A	NGA4120100HS0CA	3419	3166	2846	2548	2179	1809	1452	1092	831	666	449	325	258	216	132	117	49.0
A412/120A	NGA4120120HS0CA	4111	3836	3360	2862	2531	2052	1764	1377	1086	903	516	366	300	247	167	138	64.0
A412/180A	NGA4120180HS0CA	5527	5201	4688	4216	3635	3257	2668	2037	1564	1306	762	541	421	344	208	164	78.0

1.60 Vpc – Discharge in W/block at 20 °C

A406/165A	NGA4060165HS0CA	2988	2940	2844	2747	2603	2362	2121	1716	1367	1130	707	535	421	356	226	184	79.8
A412/20G5	NGA4120020HS0BA	845	779	657	561	440	365	309	236	172	137	84.9	61.6	48.9	41.5	27.4	23.1	10.7
A412/32G6	NGA4120032HS0BA	1307	1223	1019	877	756	622	521	403	306	250	165	110	87.0	71.0	48.0	39.0	16.0
A412/50A	NGA4120050HS0CA	2105	1989	1583	1362	1151	930	814	613	489	347	218	154	118	93.0	66.0	52.0	24.0
A412/65G6	NGA4120065HS0BA	2718	2576	2192	1946	1637	1345	1113	853	618	531	295	200	168	135	92.0	75.5	33.7
A412/90A	NGA4120090HS0CA	3198	2947	2565	2264	1971	1588	1339	1056	816	675	408	292	231	194	134	113	51.0
A412/100A	NGA4120100HS0CA	3689	3351	2952	2646	2261	1859	1471	1098	834	668	450	335	259	216	133	117	49.0
A412/120A	NGA4120120HS0CA	4296	4060	3596	3019	2609	2110	1803	1397	1103	913	520	368	301	248	167	138	64.0
A412/180A	NGA4120180HS0CA	5989	5503	4895	4417	3749	3343	2703	2053	1573	1311	771	542	421	344	208	164	78.0