



The company performing R&D and production of all kind of microwave garnets, spinels, hexaferrites, absorbing ferrites, and microwave ceramics used in various components of broad spectrum of radio engineering facilities such as radar antennas, telecommunication complexes including mobile satellite stations, electronic countermeasure systems, high power nonreciprocal devices of particle accelerators, different contactless measuring/sensor instruments, the list can go on-and-on.

**FERRITE DOMEN Co.**

8, Chernigovskaya St.,
196084 St. Petersburg,
Russia

Phone +7 (812) 387 7187

Fax +7 (812) 388 3791

E-mail: info@domen.ru

www.ferrite-domen.com

Symbols

$4\pi M_s$	Saturation magnetization	Gauss
DH	FMR linewidth	Oe
ϵ	Dielectric constant	
$tg\epsilon$	Dielectric loss tangent	
g_{eff}	Landé factor	
T_C	Curie temperature	°C
DH_k	Spin wave linewidth	Oe
H_C	Coercive force	Oe
B_r	Remanent flux density	Gauss
H_{Aeff}	Effective anizotropy field	Oe
r	Density	g/cm^3

Nickel spinels

The spinels of this group feature high Curie temperature. They are widely used in resonance devices operating at cm- and mm- wave ranges.

Material grade	$4\mu M_s$ G ±5%	DH (-3dB) Oe	ec ±5%	$tg d_e \cdot 10^4$	g_{eff} ±5%	T_c °C nomin.	H_c Oe nomin.	B_r G nomin.
SN-500	5000	≤150	13.4	≤6	2.11	345	1.5	3500
SN-475	4750	≤205	13.2	≤4	2.14	400	2.0	3150
SN-475-1	4750	≤170	13.7	≤5	2.11	325	1.0	2850
SN-450	4500	≤215	13.5	≤6	2.13	430	1.0	3100
SN-400	4000	≤240	13.6	≤4	2.12	480	1.9	2400
SN-350	3500	≤360	13.2	≤6	2.21	540	3.8	2340
SN-315	3150	≤300	13.7	≤4	2.17	560	3.0	2000
SN-285	2850	≤300	13.7	≤5	2.20	550	3.0	1200
SN-250	2500	≤265	13.7	≤5	2.20	530	3.5	1100
SN-230	2300	≤205	13.2	≤6	2.20	500	3.5	900

Nickel spinels, hot-pressed

The hot-pressed Nickel spinels are characterized by very low porosity and high thermal conductivity of ferrite article body. They are recommended for use in microstrip microwave devices as well as high power waveguide ones.

Material grade	$4\mu M_s$ G ±5%	DH (-3dB) Oe	ec ±5%	$tg d_e \cdot 10^4$	g_{eff} ±5%	T_c °C nomin.	H_c Oe nomin.	B_r G nomin.	DH_k Oe nomin.
SH-520	5200	≤100	14.3	≤2	2.08	355	1.0	2740	6.0
SH-500	5000	≤130	14.0	≤4	2.10	345	1.4	1800	12.5
SH-495	4950	≤175	13.9	≤4	2.09	420	1.9	2650	—
SH-435	4350	≤145	13.9	≤6	2.10	440	4.0	2300	—
SH-315	3150	≤240	13.7	≤3	2.17	560	4.0	1350	—
SH-295	2950	≤240	13.9	≤5	2.17	550	3.2	1600	25
SH-230	2300	≤130	13.5	≤5	2.26	500	10.8	900	35

Lithium spinels

Lithium spinels of this group feature low non-resonant magnetic losses, high remanent flux density, and high Curie temperature.

They are mostly used in non-resonant controlled devices of low power levels at cm- and mm-wave ranges (phase shifters, switches etc.).

Material grade	$4\mu M_s$ G ±5%	DH (-3dB) Oe	ec ±5%	$tg d_e \cdot 10^4$	g_{eff} ±3%	T_c °C nomin.	H_c Oe nomin.	B_r G nomin.
SL-475	4750	≤300	14.4	≤6	2.06	450	1.1	3250
SL-450	4500	≤335	15.1	≤5	2.02	520	1.1	2900
SL-400	4000	≤480	15.0	≤6	2.06	570	1.4	2600
SL-315	3150	≤505	15.5	≤4	2.05	560	1.5	2150
SL-225	2250	≤350	16.3	≤5	2.04	430	1.1	1650
SL-210	2100	≤335	16.3	≤7	2.00	430	1.2	1500
SL-200	2000	≤430	16.2	≤5	2.02	440	1.3	1450
SL-155	1550	≤420	16.6	≤5	2.05	390	1.1	1100



Hexaferrites occupy a special place among the microwave magnetic materials. They feature high magnetic anisotropy (17 kOe) and are recommended for the use in millimeter wave isolators and circulators workable at frequencies 10 GHz through 100 GHz. Hexaferrites permit to create miniaturized yet discrete microwave devices that do not require a permanent biasing magnets in the component package.

High density hexaferrites are ideal for MIC application and microstrip mm-wave devices.

Hexaferrites

Material grade	H_{Aeff} kOe $\pm 5\%$	$4\mu M_s$ G $\pm 5\%$	DH (-3dB) kOe	$e\epsilon$ $\pm 5\%$	$tg d_e \cdot 10^4$	T_c oC nomin	H_c kOe nomin.	r g/cm ³
H 6	6	2850	<3,0	13	<10	450	0,07	4,20
H 9	9	3000	<3,5	13	< 8	475	0,15	4,10
H12	12	3150	<3,5	13	< 8	520	0,4	4,10
H15	15	2900	<3,5	13	< 8	400	1,5	4,10
H18	18	2200	<3,5	13	<10	435	2,5	4,10
H21	21	1800	<3,0	13	<20	400	2,8	4,10
H23	23	1900	<3,5	14	<10	310	3,0	4,10
H25	25	1700	<3,5	14	<10	300	3,0	4,10
H28	28	1400	<3,5	14	<10	270	3,0	4,10
H31	31	1500	<3,0	15	<20	255	3,0	4,40
H33	33	1600	<3,0	15	<20	237	3,0	4,40
H35	35	1400	<3,5	15	<20	215	3,0	4,40

High density hexaferrites

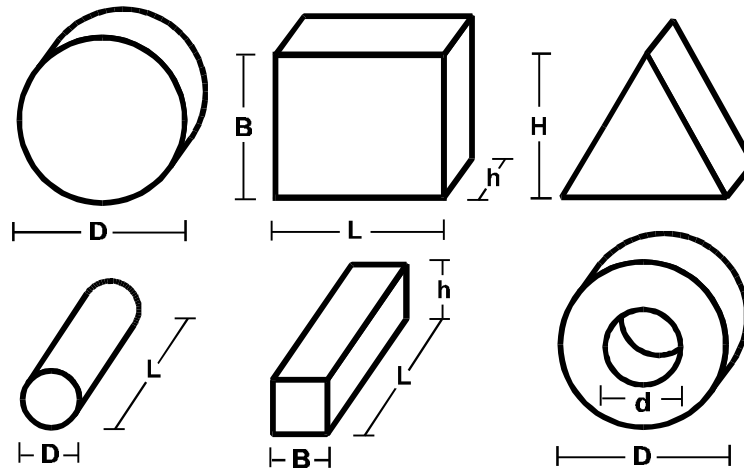
Material grade	H_{Aeff} kOe $\pm 5\%$	$4\mu M_s$ G $\pm 5\%$	DH (-3dB) kOe	$e\epsilon$ $\pm 5\%$	$tg d_e \cdot 10^4$	T_c oC nomin	H_c kOe nomin.	r g/cm ³
HD 6	6	3400	<2,5	17	<10	450	0,05	4,90
HD11	11	3700	<2,5	17	<10	507	0,1	4,90
HD16	16	3300	<2,0	17	<10	465	1,5	4,90
HD17	17	4300	<2,0	20	< 8	470	0,6	5,20
HD19	19	3500	<2,0	17	< 6	400	2,5	4,90
HD20	20	2400	<2,0	17	<10	400	0,6	4,90
HD22	22	3000	<1,5	18	< 8	340	3,0	4,95
HD28	28	2100	<1,5	17	<10	270	3,0	4,95
HD30	30	2000	<1,5	17	<10	260	3,0	4,95
HD32	32	1800	<1,5	17	<10	250	3,0	4,95
HD33	33	1700	<1,5	17	<10	240	3,0	4,95



STANDARD FORM AND DIMENSIONS OF MICROWAVE FERRITE PARTS

Ferrite parts can be delivered both as fired or machined articles.

SHAPES



Parts as fired, dimensions (mm)

	Disks	Plates (square, rectangle, triangle)	Round and square cross-section rods	Rings
D	10...120		5...40	5...100
L		15...120	20...120	
B		5...60	5...30	
H		≤90		
h	3...10	3...10	5...15	2.5...15
d				2...70

Standard tolerances: $\pm (3...4)\%$

Machined parts are to be delivered in accordance with the Customer's drawings.

Standard tolerances: ± 0.02 mm

Standard finish: Ra 0.6 mm



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