

Standard material characteristics (Power material)

Property	Symbol	Condition	Unit	6H10	6H20	6H40	6H41	6H42	7H10	7H20												
AC initial permeability	μ_i	0.1 MHz	—	2500	2300	2400	2500	3400	1500	1000												
Saturation magnetic flux density	Bs (1000 A/m)	23 °C	mT	510	510	530	530	530	480	480												
		100 °C		390	390	430	430	430	380	380												
Residual magnetic flux density	Br	23 °C	mT	110	130	110	110	110	150	130												
Coercivity	Hc	23 °C	A/m	13	13	10	10	10	30	25												
Relative loss factor	$\tan\delta/\mu_i$	0.1 MHz	$\times 10^{-6}$	<5	<5	<3	<3	<3	<5	<4												
											Core loss	200 mT	25 kHz	kW/m ³	23 °C	—	—	90	75	60	—	—
															40 °C	—	—	75	60	50	—	—
															60 °C	65	80	60	50	40	—	—
															80 °C	55	65	50	40	45	—	—
															100 °C	80	55	40	45	55	—	—
															23 °C	—	—	650	550	450	—	—
													100 kHz	kW/m ³	40 °C	—	—	550	450	350	—	—
															60 °C	450	550	450	350	300	—	—
															80 °C	400	450	350	300	325	—	—
															100 °C	500	400	300	325	375	—	—
															60 °C	—	—	—	—	—	100	50
															80 °C	—	—	—	—	—	80	40
													50 mT	kW/m ³	100 °C	—	—	—	—	—	100	50
60 °C	—	—	—	—	—	400	200															
80 °C	—	—	—	—	—	400	200															
100 °C	—	—	—	—	—	500	250															
60 °C	—	—	—	—	—	—	—															
80 °C	—	—	—	—	—	—	—															
Temperature coefficient	$\alpha_{\mu r}$	20 °C~80 °C	$\times 10^{-6}$	8	8	8	8	8	8	8												
Curie temperature	Tc	—	°C	>200	>200	>200	>200	>200	>200	>200												
Resistivity	ρ	—	$\Omega \cdot m$	3	3	2	2	2	5	5												
Apparent density	d	—	$\times 10^3 \text{ kg/m}^3$	4.8	4.8	4.9	4.9	4.9	4.8	4.8												

Note: 1) The values were obtained with toroidal cores (FR25/15/5).
 2) The values were obtained at 23±2 °C unless otherwise specified.
 3) Initial permeability was measured at 10kHz, 0.8A/m.

Standard material 6H Series

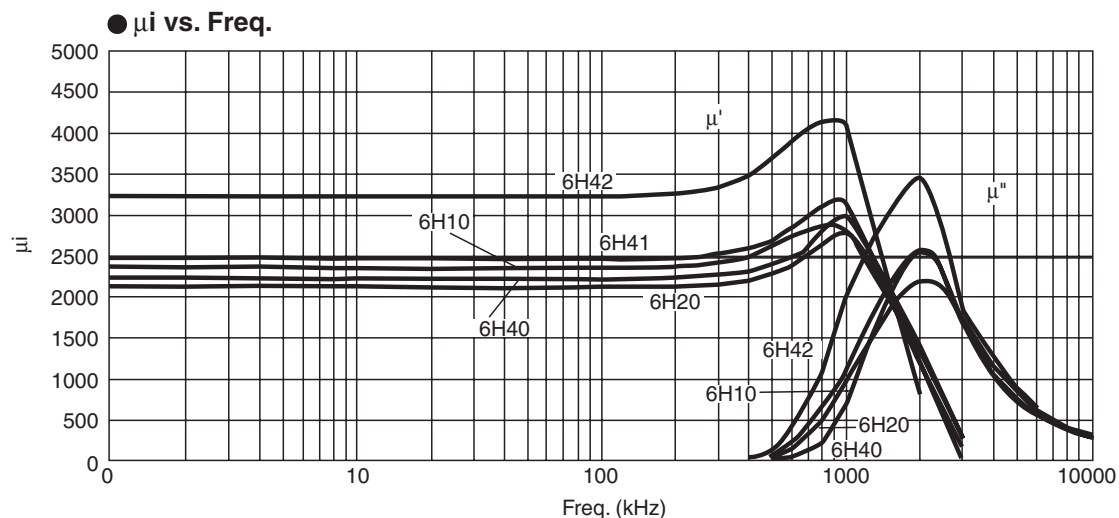
6H series are FDK's standard power material with low core loss and high saturation flux density, and are suitable for wide range of transformers and choke coils for switching power supply.

6H20 is standard material with superb characteristics and high cost performance. 6H10 has higher permeability than 6H20 in room temperature, and is suitable for ungapped cores for FF type transformers.

In addition to above, FDK has developed new materials with lower core loss and higher magnetic flux density, which satisfies latest requirements of digital and mobile electronics.

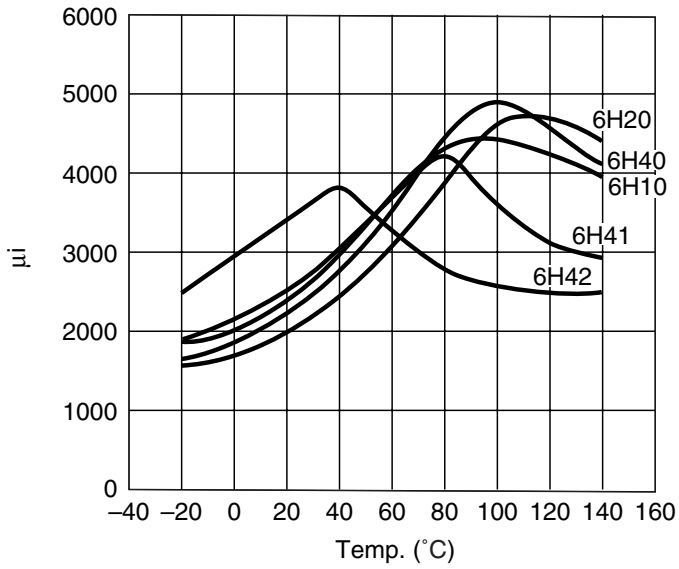
Core loss of new 6H40 material is around 25 % lower than that of standard 6H20, and is suitable for transformers and choke coils for flat, low profile power supplies and AC/DC adaptors of electronic equipments (such as notebook PCs), which strictly require low temperature rise.

For transformers and choke coils of mobile electronic equipments, FDK has developed 6H41 material (bottom temperature of core loss curve 80 °C) and 6H42 (bottom temperature 50 °C), which enables low operation temperature of transformers. (This is key point for mobile equipments, which have frequent contact with human body.)

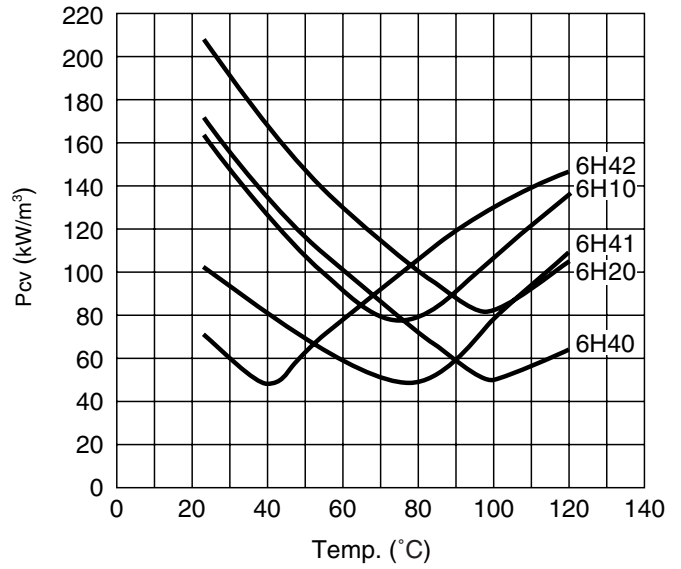


Standard material 6H Series

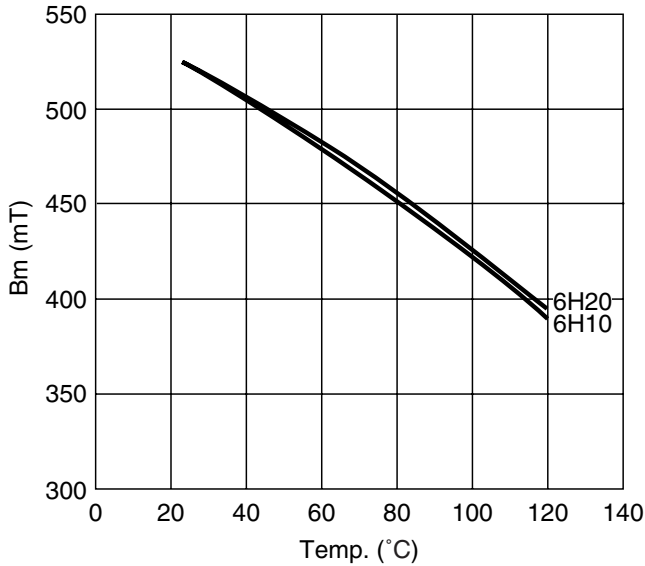
● **mi vs. Temp.**



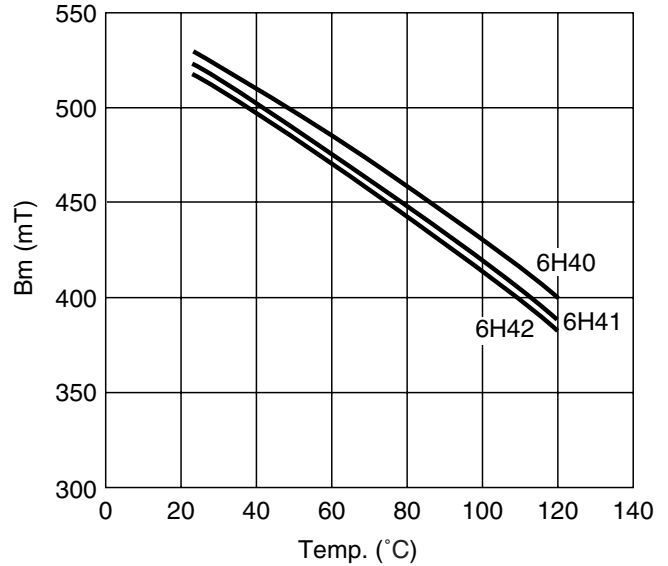
● **Pcv vs. Temp. 50kHz, 150 mT**



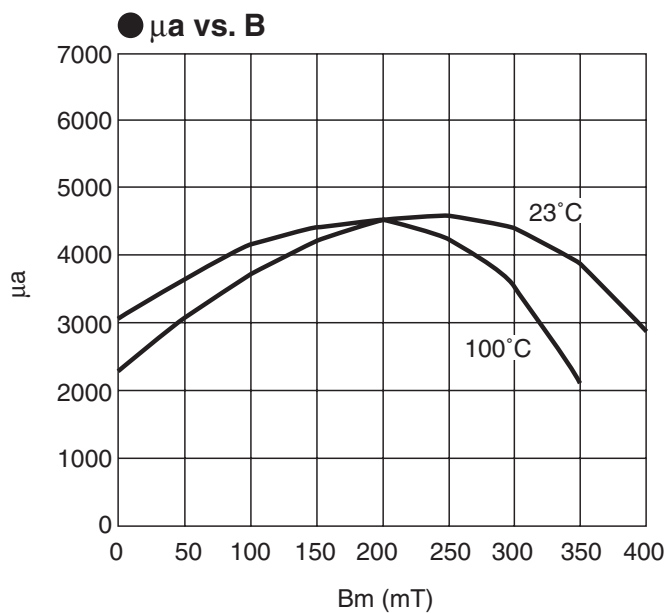
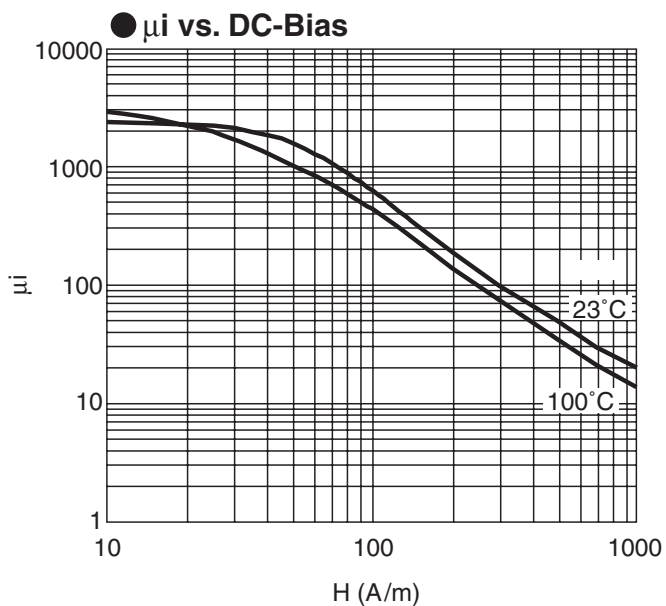
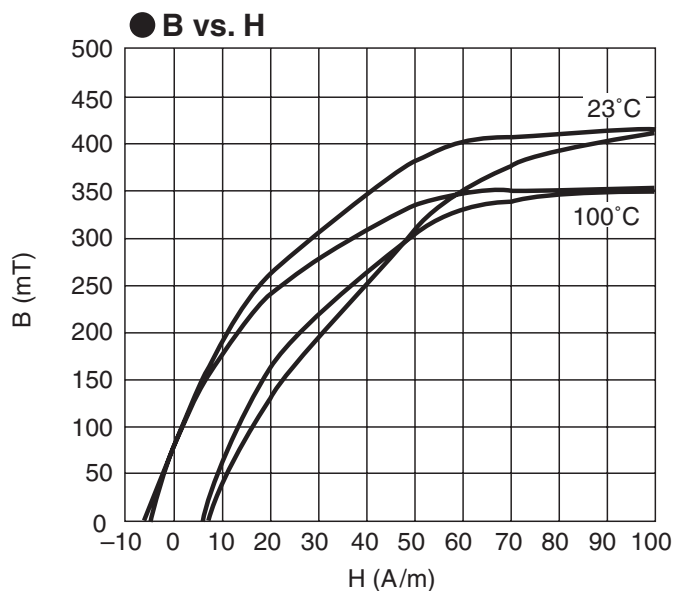
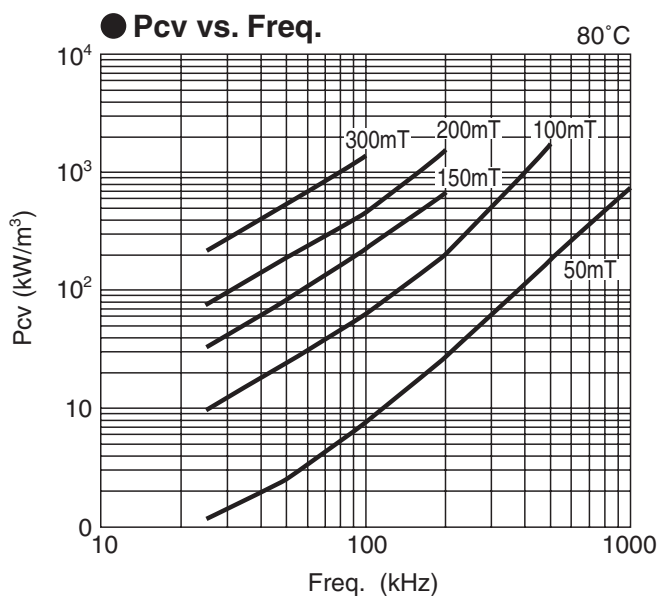
● **Bm vs. Temp.**



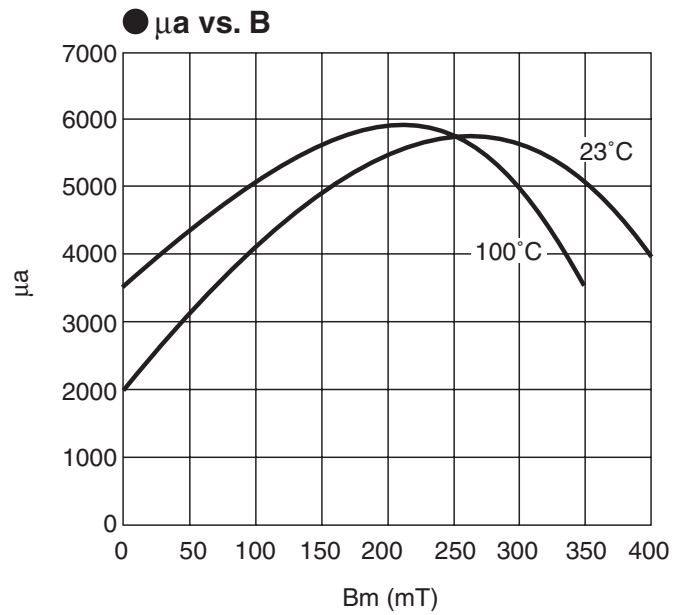
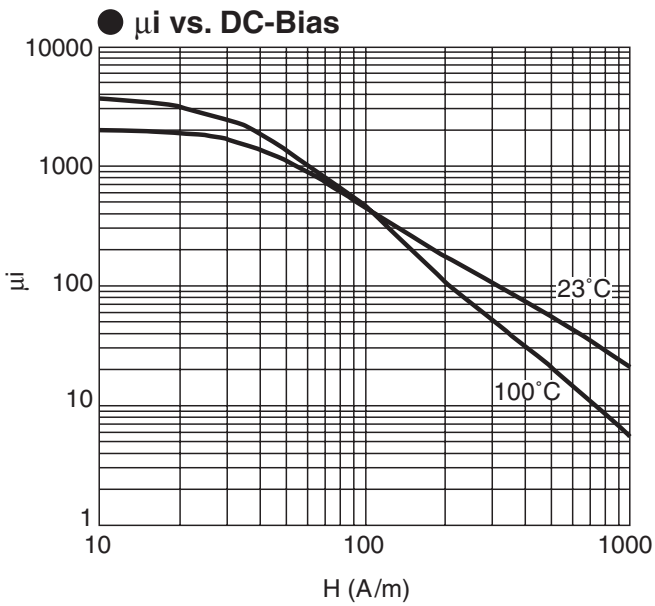
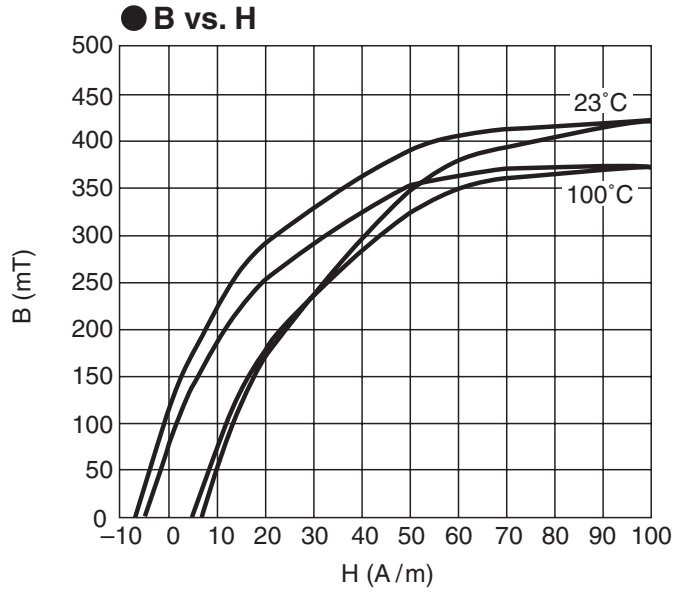
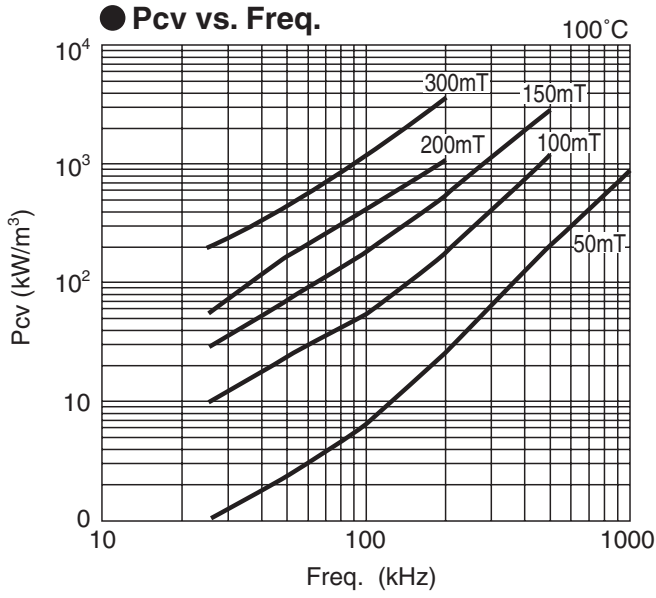
● **Bm vs. Temp.**



6H10

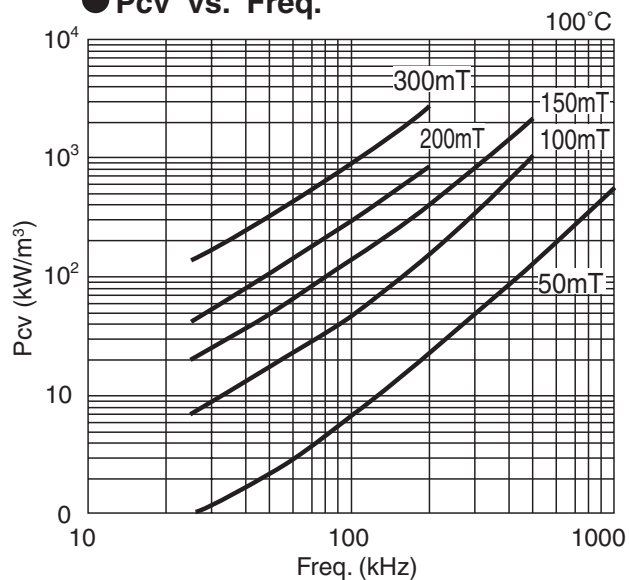


6H20

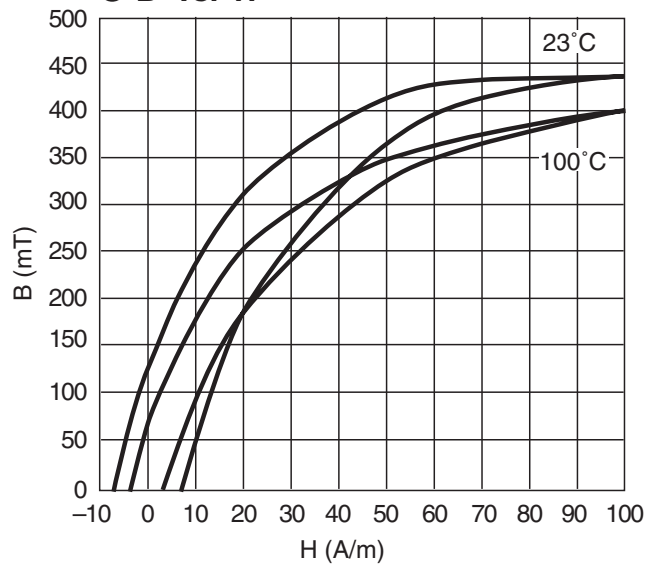


6H40

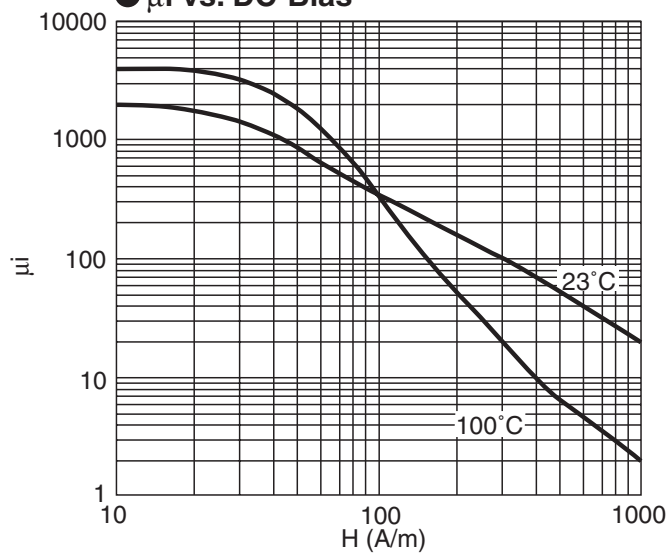
● **P_{cv} vs. Freq.**



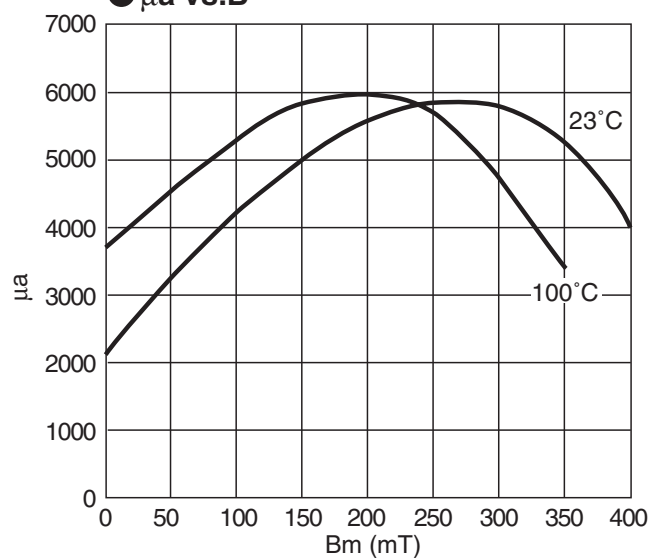
● **B vs. H**



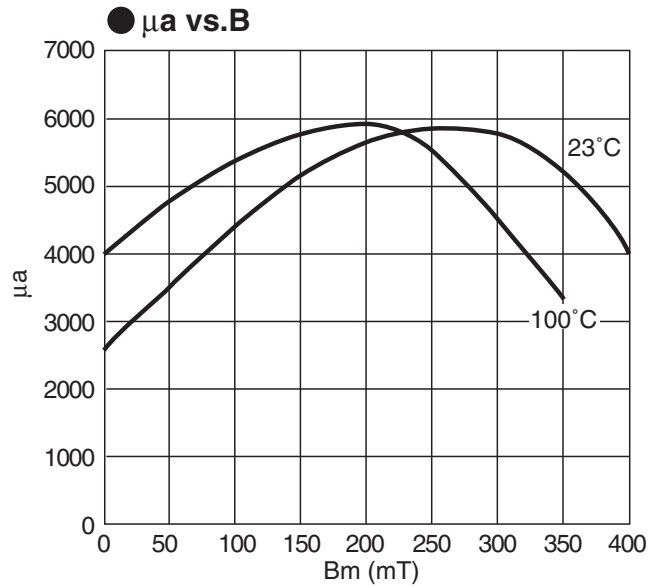
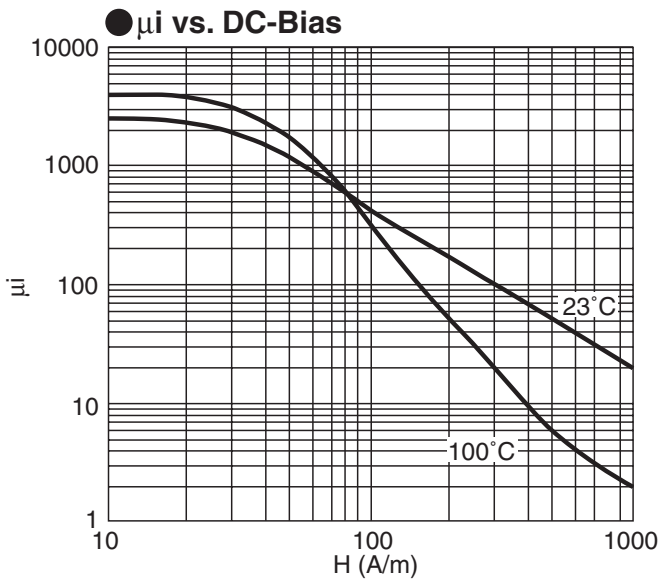
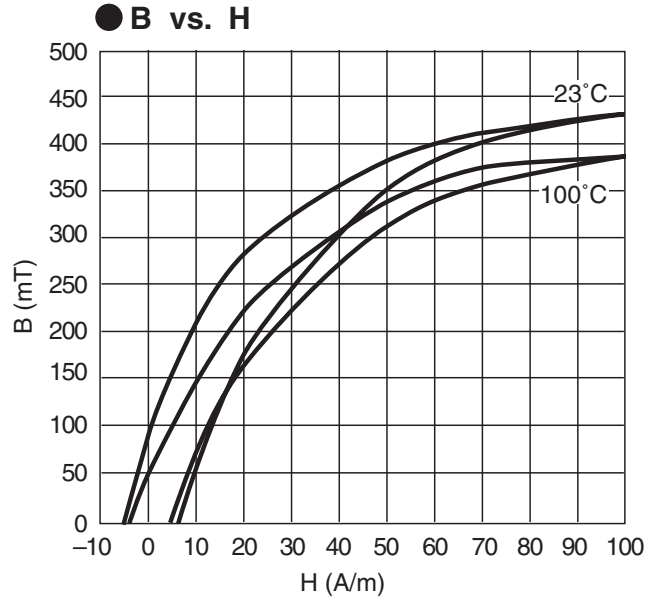
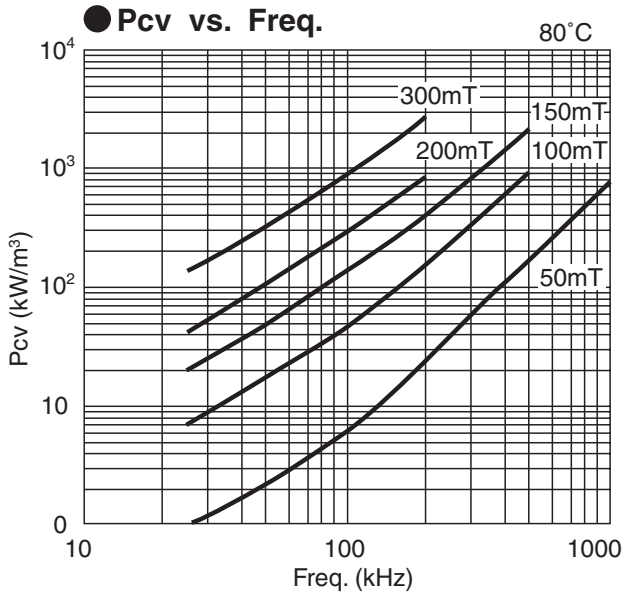
● **μ_i vs. DC-Bias**



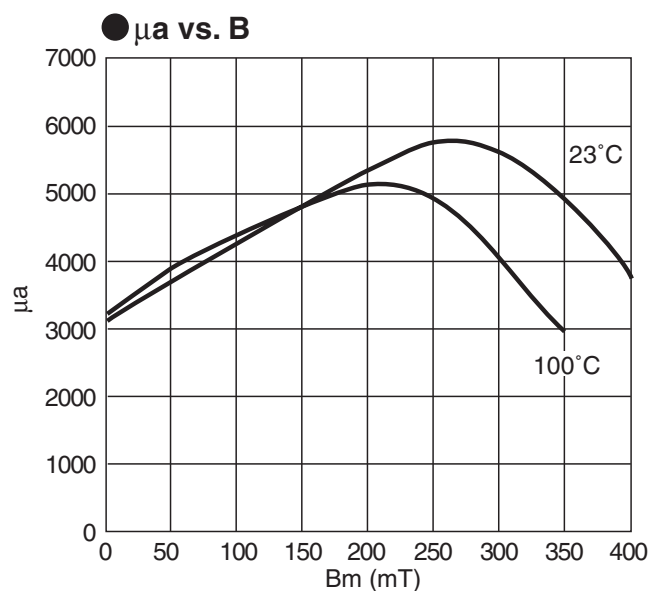
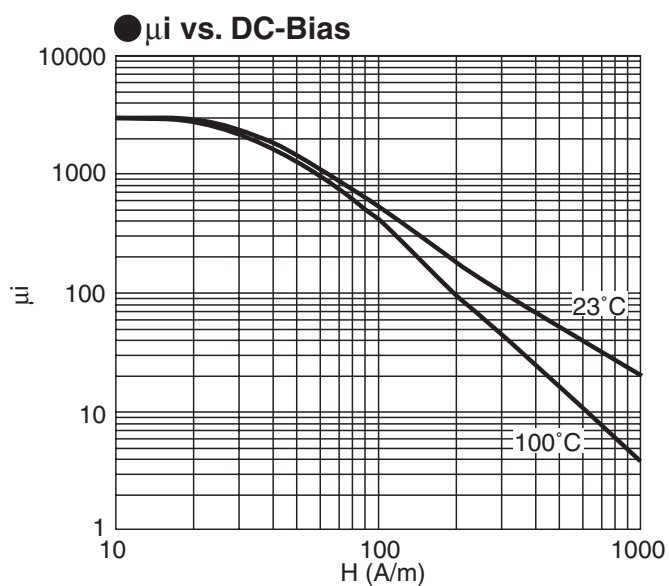
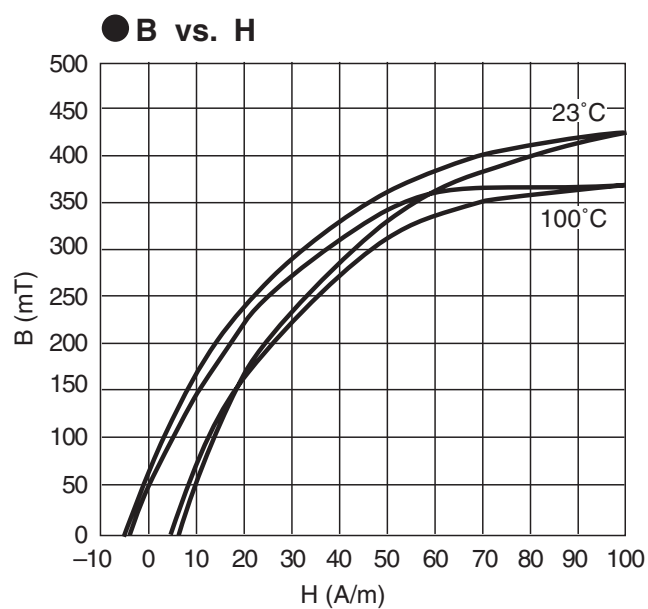
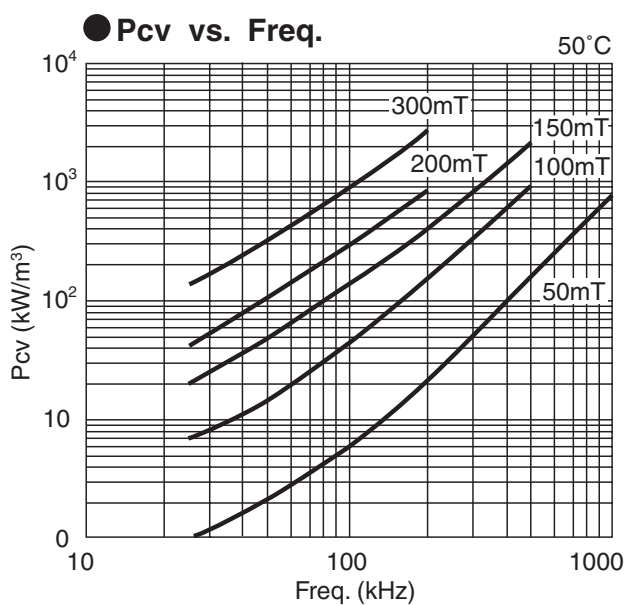
● **μ_a vs. B**



6H41



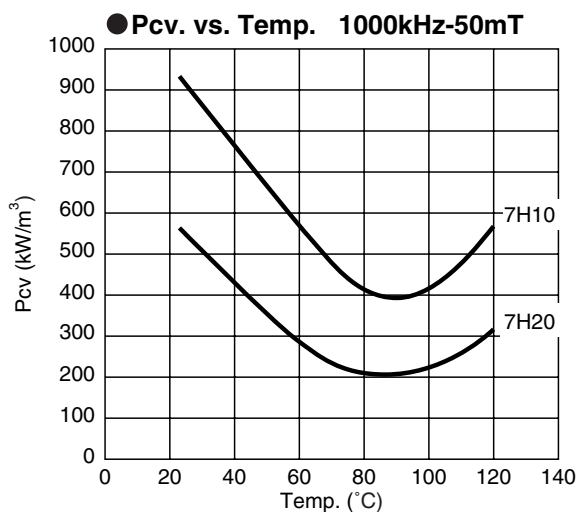
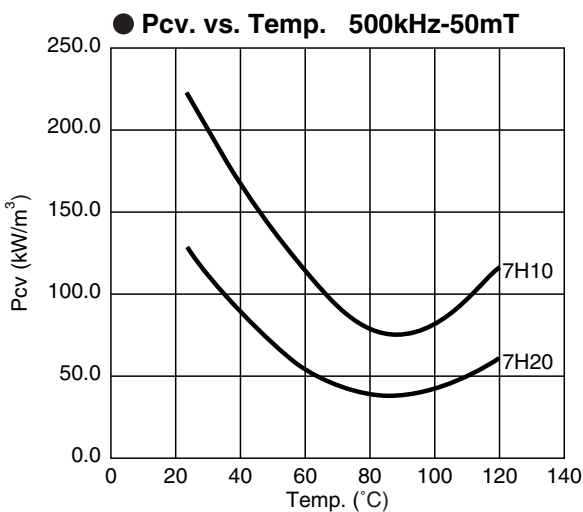
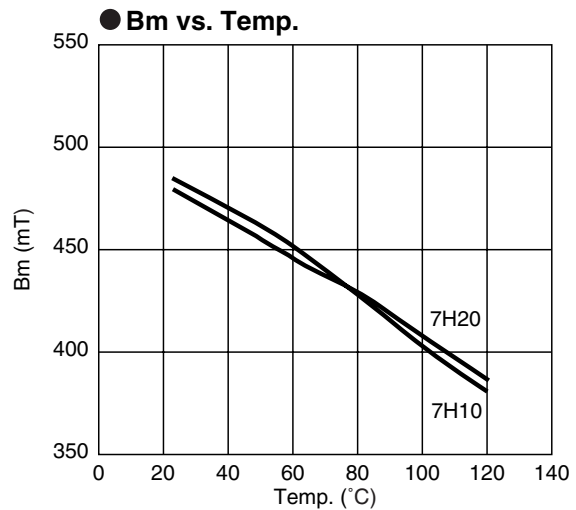
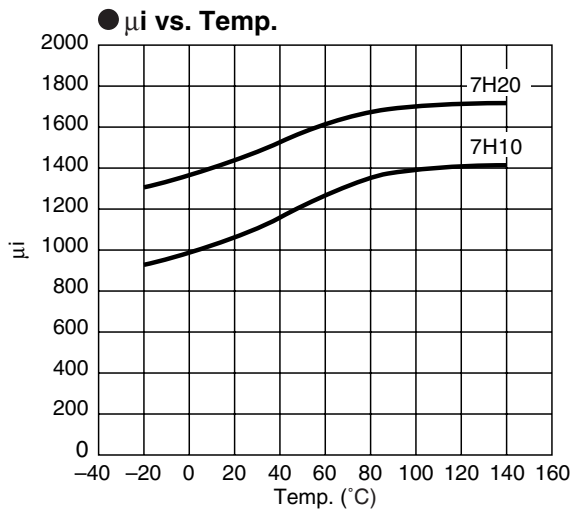
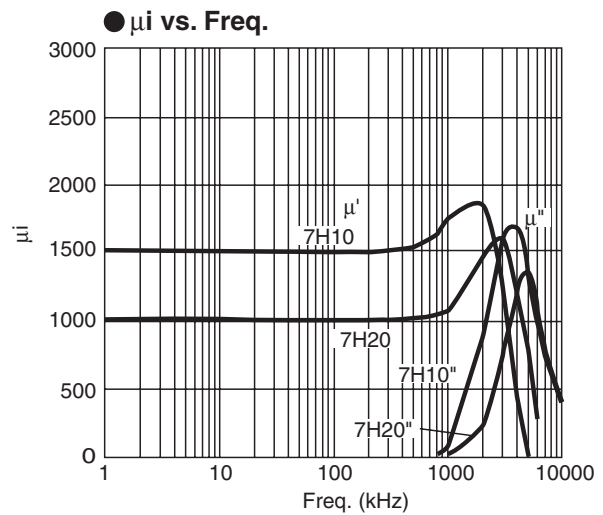
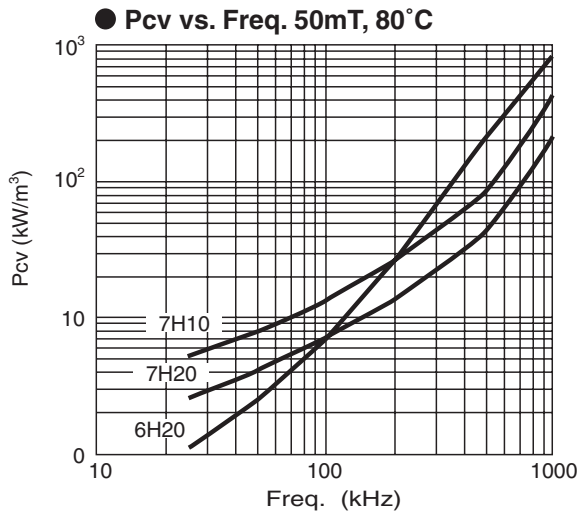
6H42



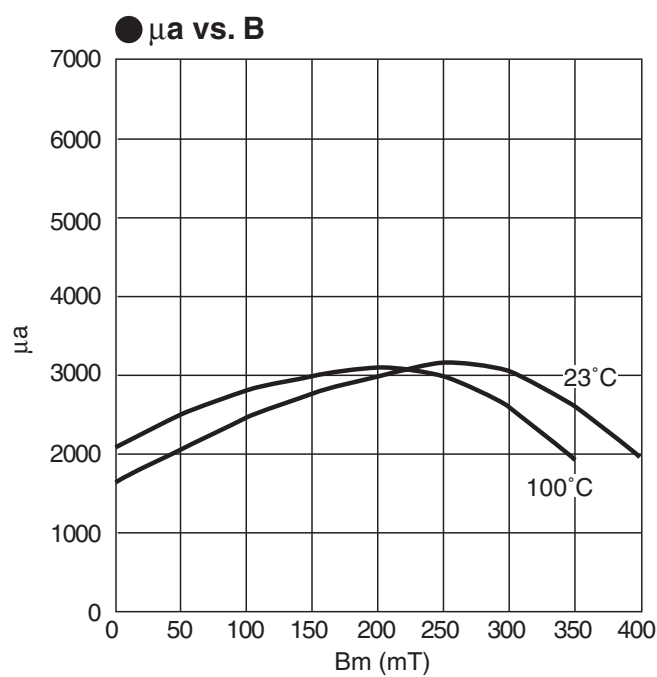
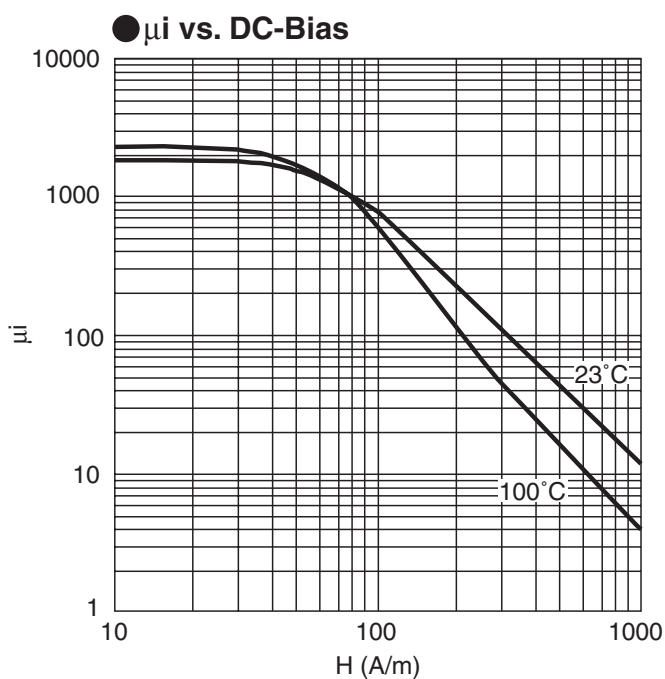
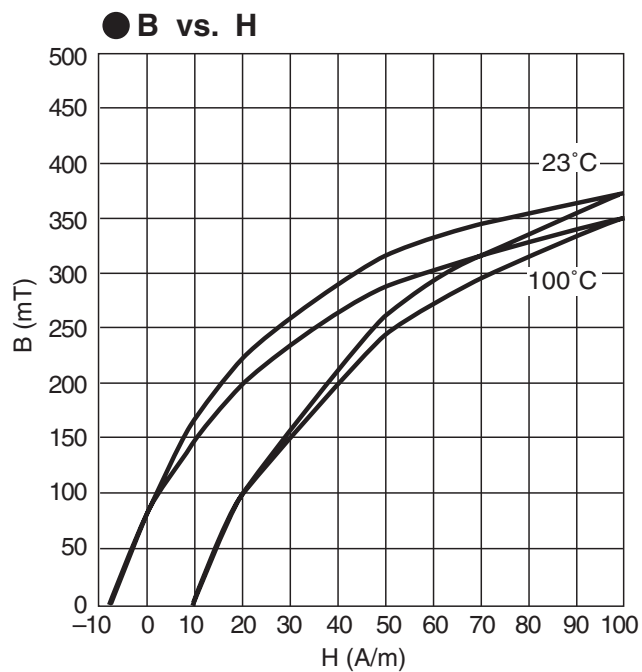
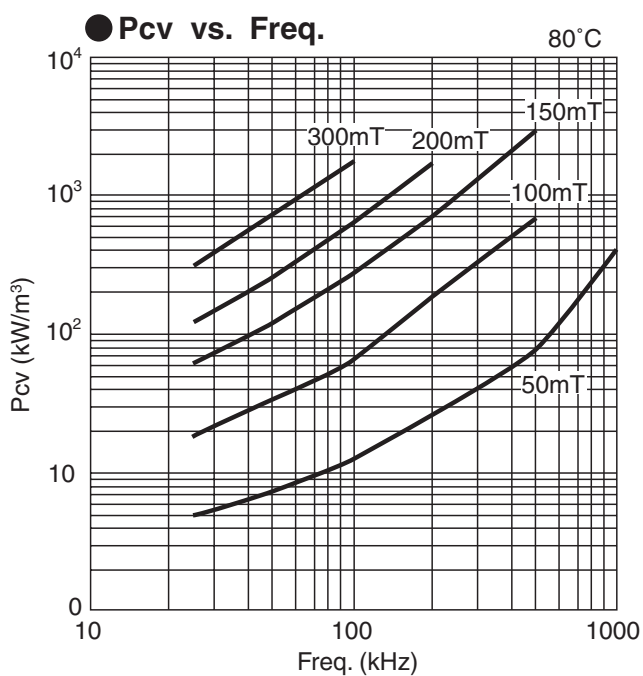
High frequency material 7H Series

7H series are power material with advantage of low core loss in high frequency range, and suitable for transformers and choke coils of high frequency switching power supply.

7H10 is suitable for switching frequency over 500 kHz. Latest material 7H20 is suitable still higher frequency over 1000 kHz, and its core loss is around 50 % lower than 7H10.



7H10



7H20

