Table SI Density of $Mg_{3+x}Sb_{1.5}Bi_{0.49}Te_{0.01}$ (x=0.01-0.2). All samples are over 95 % dense compare to theoretical value 4.49 g/ cm^3 calculated from Vegard's law (4.04 g/cm^3 for Mg_3Sb_s; 5.84 g/cm^3 for Mg_3Bi_2).

Nominal x	x=0.01	x=0.03	x=0.1	x=0.2	x=0.2
Density (g/cm^3)	4.31(4)	4.41(2)	4.28(5)	4.28(3)	4.37(3)

Table SII Lattice constants of $Mg_{3+x}Sb_{1.5}Bi_{0.49}Te_{0.01}$ (x =0.01-0.2) as a function of nominal excess Mg content (x =0.01-0.2).

Nominal x	x=0.01	x=0.03	x=0.1	x=0.2
a (Å)	4.5839(1)	4.5840(1)	4.5820(1)	4.5841(1)
c (Å)	7.2727(6)	7.2744(6)	7.2718(6)	7.2748(5)

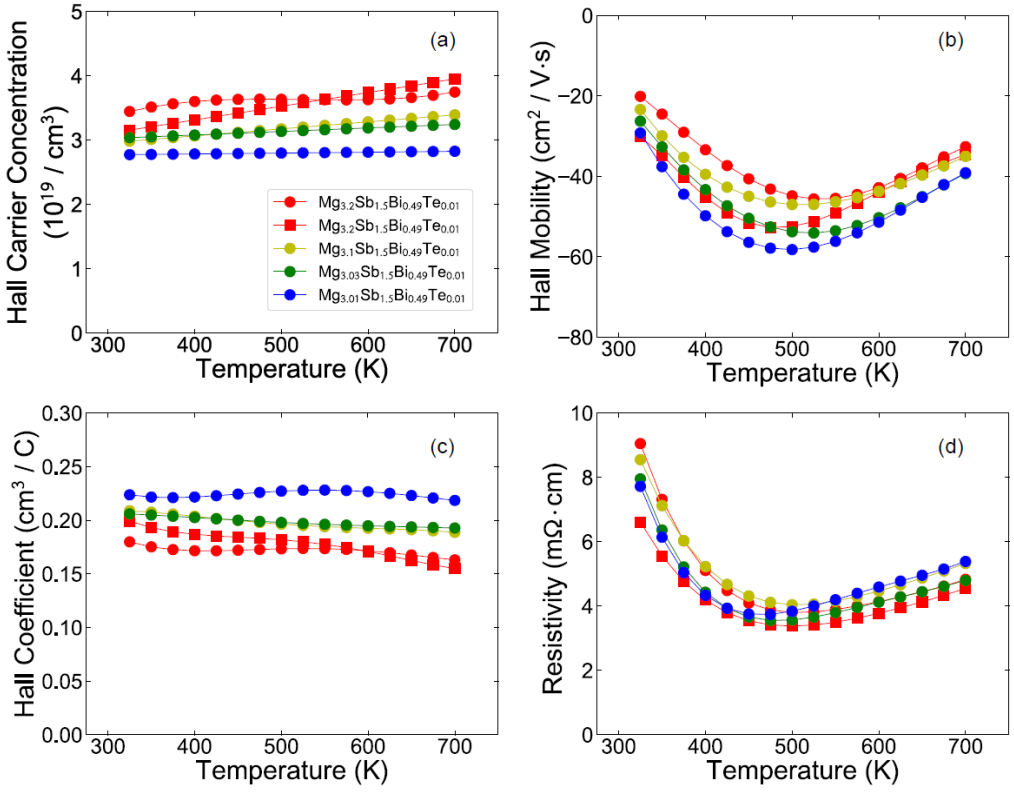

Figure S1 Results of Hall measurement for $Mg_{3+x}Sb_{1.5}Bi_{0.49}Te_{0.01}$ (x=0.01-0.2) as a function of temperature: (a) Hall Carrier Concentration; (b) Hall mobility; (c) Hall coefficient; (d) electrical resistivity.

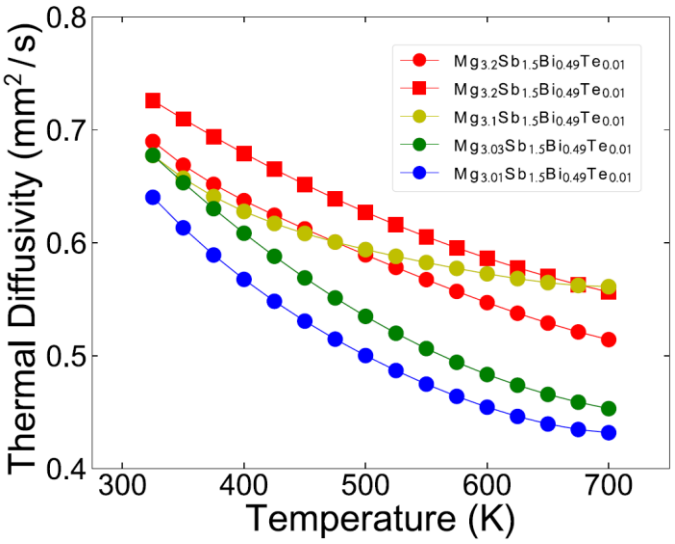

Figure S2 Thermal diffusivity of $Mg_{3+x}Sb_{1.5}Bi_{0.49}Te_{0.01}$ (x=0.01-0.2) measured as a function of temperature.