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**Monocrystalline GaAs Supplemental Datasheet Notes for use with
Zemax Optic Studio Software and Synopsis Code-V Optical Design Software**

The following information is provided for optical design engineers using AMI Monocrystalline GaAs (100) boule material. Data is for material at 25 °C. The coefficients provided are based on the use of the Sellmeier-1 equation for Room Temperature at time of index measurement, whereby, the value "1" found in the (n_{λ}^2-1) term is actually the original Sellmeier Type-1 variable " K_0 " term. (i.e., K_0 is forced to be equal to 1 to accommodate OS software requirements.)

$$(n_{\lambda}^2-1) = K_1 * (\lambda^2 / (\lambda^2 - L_1)) + K_2 * (\lambda^2 / (\lambda^2 - L_2)) + K_3 * (\lambda^2 / (\lambda^2 - L_3))$$

Zemax Optic Studio Sellmeier-1 Coefficients		Statistics of Fit	
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K_1	-26.302550392	S1	0.00000
L_1	0.04314529983	S2	2249.838
K_2	36.1720349094	S3	2249.838
L_2	0.06519717042	R2	1.00000
K_3	1.05106227714	V2	0.00013
L_3	845.53966967		
K_0	1.0000000		

GaAs RT 25 °C Measured Index Data vs Sellmeier-1 Calculated Data

Wavelength (λ , um)	Index Measured	Index Using Coefficients	Index Difference
0.9000	3.61536	3.54330	0.00144
1.0000	3.54186	3.49357	-0.00223
1.5000	3.49580	3.38110	0.00035
2.0000	3.38076	3.34321	0.00166
2.5000	3.34154	3.32568	0.00070
3.0000	3.32498	3.31593	0.00005
4.0000	3.31588	3.30546	-0.00057
5.0000	3.30603	3.29948	-0.00073
6.0000	3.30021	3.29497	-0.00066
7.0000	3.29563	3.29087	-0.00048
8.0000	3.29135	3.28672	-0.00024
9.0000	3.28696	3.28226	0.00002
10.0000	3.28224	3.27731	0.00024
11.0000	3.27707	3.27171	0.00039
12.0000	3.27132	3.26531	0.00039
13.0000	3.26492	3.25794	0.00016
14.0000	3.25778	3.24940	-0.00040

Monocrystalline (100) GaAs Thermal Optical Coefficient Data

$$\Delta n_{\lambda} = ((n_{\lambda}^2 - 1) / (2n_{\lambda})) \times [D_0 \Delta T + D_1 (\Delta T)^2 + D_2 (\Delta T)^3 + ((E_0 \Delta T + E_1 (\Delta T)^2) / (\lambda^2 - S_{TK} (\lambda_{TK})^2))]$$

Zemax Optic Studio Sellmeier-1 Thermal Coefficients		Statistics of Fit	
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D₀	1.288699451E-04	S1	0.0000E+00
D₁	-7.220716791E-07	S2	4.0829E-03
D₂	1.367279164E-08	S3	4.0829E-03
E₀	-9.988982342E-04	R2	1.0000E+00
E₁	3.047378428E-05	V2	0.0000E+00
S_{KT}	-1.000000E+00		
λ_{KT}	7.384003040E+00		

Δn/ΔT Comparison of Measured Data 6th Order Polynomial Fit to Zemax Optic Studio Equation Fit using Thermal Coefficients

λ (um)	Temp (°C, ref.)	Index (n, ref.)	Temp (°C, Final)	ΔT (°C)	Δn Calculated	Δn/ΔT Optic Studio	Δn/ΔT Meas. Data Fit	Δn/ΔT Difference
0.5	25	4.25961	80	55	1.581E-02	2.88E-04	8.65E-04	-5.774E-04
1	25	3.49357	80	55	1.259E-02	2.29E-04	6.43E-04	-4.145E-04
1.5	25	3.38110	80	55	1.209E-02	2.20E-04	4.83E-04	-2.631E-04
2	25	3.34321	80	55	1.189E-02	2.16E-04	3.70E-04	-1.534E-04
3	25	3.31593	80	55	1.170E-02	2.13E-04	2.42E-04	-2.917E-05
4	25	3.30546	80	55	1.157E-02	2.10E-04	1.92E-04	1.790E-05
5	25	3.29948	80	55	1.146E-02	2.08E-04	1.79E-04	2.931E-05
6	25	3.29497	80	55	1.135E-02	2.06E-04	1.78E-04	2.877E-05
7	25	3.29087	80	55	1.126E-02	2.05E-04	1.77E-04	2.744E-05
8	25	3.28672	80	55	1.117E-02	2.03E-04	1.74E-04	2.875E-05
9	25	3.28226	80	55	1.110E-02	2.02E-04	1.70E-04	3.214E-05
10	25	3.27731	80	55	1.103E-02	2.00E-04	1.65E-04	3.588E-05
11	25	3.27171	80	55	1.096E-02	1.99E-04	1.60E-04	3.881E-05
12	25	3.26531	80	55	1.090E-02	1.98E-04	1.57E-04	4.101E-05
13	25	3.25794	80	55	1.084E-02	1.97E-04	1.53E-04	4.356E-05
14	25	3.24940	80	55	1.078E-02	1.96E-04	1.49E-04	4.710E-05

Graphical Presentation of GaAs Thermal Coefficient $\Delta n/\Delta T$ Data

