Product Roadmap: Flash Memory

Q3 2021
Cypress Semiconductor Corp.
An Infineon Technologies Company

NOR Flash Memory Family

NOR Flash Memory Family Decoder

S 25 H S 512 T

Technology:
J = 110-nm Floating Gate (FG)
K = 90-nm FG
L = 65-nm FG
N = 110-nm MIRRORBIT™ (MB)
P = 90-nm MB
R, S = 65-nm MB
T = 45-nm MB

Density:
008 = 8Mb
016 = 16Mb
032 = 32Mb
064 = 64Mb
128 = 128Mb
256 = 256Mb
512 = 512Mb
01G = 1Gb
02G = 2Gb
04G = 4Gb

Voltage:
D = 2.5 V
L = 3.0 V
S = 1.8 V

Family:
A = Standard ADP (Address-Data Parallel)
C = Burst Mode ADP (Address-Data Parallel)
F = Serial
G = Page Mode
H = High-Performance Serial
J = Simultaneous Read/Write ADP (Address-Data Parallel)
K = HYPERBUS™
P = Page Mode Simultaneous Read/Write ADP (Address-Data Parallel)
V = Burst Mode Simultaneous Read/Write ADM (Address-Data Multiplexed)
X = Burst Mode Simultaneous Read/Write AADM (Address-Address-Data Multiplexed)

Series:
25 = SPI
35 = SPI with Security
29 = Parallel
26 = HYPERBUS™
36 = HYPERBUS™ with Security
70 = Stacked Die
28 = Octal
38 = Octal with Security
79 = Dual Quad SPI

Prefix:
S

NOR Flash Memory Product Portfolio: New Products

Family	Interface	Sector	Series	Volt	Densities	Lead	Tech	2021[1]	2022	2023	2024	2025
SEMPER™ Flash	QSPI	Hybrid	S25HS-T S25HL-T	1.8 V 3.0 V	128Mb–4Gb	512Mb	45-nm MB					
	HYPERBUS		S26HS-T S26HL-T	1.8 V 3.0 V	128Mb–4Gb	512Mb	45-nm MB					
	Octal		S28HS-T S28HL-T	1.8 V 3.0 V	128Mb–4Gb	512Mb	45-nm MB					
SEMPER™ Secure Flash	QSPI	Hybrid	S35HS-T S35HL-T	1.8 V 3.0 V	128Mb–1Gb	256Mb	45-nm MB					
	HYPERBUS		S36HS-T S36HL-T	1.8 V 3.0 V	128Mb–1Gb	256Mb	45-nm MB					
	Octal		S38HS-T S38HL-T	1.8 V 3.0 V	128Mb–1Gb	256Mb	45-nm MB					
Quad SPI	QSPI	Hybrid	S25FS-S	1.8 V	64Mb–1Gb	-	65-nm MB					
			S25FL-S	3.0 V	128Mb–1Gb	-	65-nm MB					
		Uniform 4KB	S25FL-L	3.0 V	64–256Mb	-	65-nm FG					
Specialty Low Power	QSPI	Uniform 512B	SFM3204A	0.85–2.75 V	32Mb	-	40-nm eFG[2]					
Dual Quad SPI	QSPI	Hybrid	S79FS-S S79FL-S	1.8 V 3.0 V	256Mb–1Gb	-	65-nm MB					
HYPERFLASH™	HYPERBUS	Hybrid	S26KS-S S26KL-S	1.8 V 3.0 V	128–512Mb	-	65-nm MB					
Parallel	Parallel	Hybrid	S29GL-T	3.0 V	512Mb–2Gb	-	45-nm MB					

[1] Calendar Year

[2] Embedded FG

Concept Samples Production EOL

x8 Serial NOR Flash Memory Roadmap

Product Family	Density	(Prod) [EOL]	2021[6]				2022				2023				2024				2025			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
S28HS-T[1] (1.8 V) S28HL-T[1] (3.0 V) SEMPER™ Flash with Octal Interface 45-nm MB[2]	4Gb[3] 2Gb[3, 4] 1Gb 512Mb 256Mb 128Mb	(TBD) (Q222) (TBD)																				
S26HS-T[1] (1.8 V) S26HL-T[1] (3.0 V) SEMPER Flash with HYPERBUS™ Interface 45-nm MB[2]	4Gb[3] 2Gb[3] 1Gb 512Mb 256Mb 128Mb	(TBD) (Q421) (Q322) (TBD)																				
S26KS-S (1.8 V) S26KL-S (3.0 V) HYPERFLASH™ 65-nm MB[2]	512Mb 256Mb 128Mb																					
S79FS-S (1.8 V) Dual Quad SPI 65-nm MB[2]	1Gb[5] 512Mb[5] 256Mb[5]	 (TBD) (TBD)																				
S79FL-S (3.0 V) Dual Quad SPI 65-nm MB[2]	1Gb[5] 512Mb[5] 256Mb[5]																					

[1] JEDEC xSPI Compliant
[2] Hybrid Sector
[3] Stacked Die
[4] 1.8 V only in production
[5] S79 Series (stacked die)
[6] Calendar Year

Products supported by Longevity Program unless noted

Concept
Samples
Production
EOL - LTB
EOL - LTS

x8 Serial NOR Flash Memory Portfolio

	Dual Quad SPI S79FL-S[1, 2] 65-nm MB, 3.0 V	HYPERFLASH™ S26KL-S[1] 65-nm MB, 3.0 V	SEMPER™ Flash[3] S26HL-T[1] 45-nm MB, 3.0 V	SEMPER Flash[4] S28HL-T[1] 45-nm MB, 3.0 V	Dual Quad SPI S79FS-S[1, 2] 65-nm MB, 1.8 V	HYPERFLASH™ S26KS-S[1] 65-nm MB, 1.8 V	SEMPER Flash[3] S26HS-T[1] 45-nm MB, 1.8 V	SEMPER Flash[4] S28HS-T[1] 45-nm MB, 1.8 V
	Product Family Number SDR Clock/DDR Clock * Temperature Range							
	All parts supported by Longevity Program unless noted		**S26HL04GT[5, 6]** -/133 MHz * I, A, V, B, M	**S28HL04GT[5, 6]** 133 MHz/133 MHz * I, A, V, B, M			**S26HS04GT[5, 6]** -/166 MHz * I, A, V, B, M	**S28HS04GT[5, 6]** 166 MHz/166 MHz * I, A, V, B, M
			S26HL02GT[5, 6] Q421 -/133 MHz * I[6], A[6], V[6], B, M[6]	**S28HL02GT[5, 6]** 133 MHz/133 MHz * I, A, V, B, M			**S26HS02GT[5, 6]** Q421 -/166 MHz * I[6], A[6], V[6], B, M[6]	**S28HS02GT[5]** 166 MHz/166 MHz * I[6], A[6], V[6], B, M
≥256Mb	**S79FL01GS** 133 MHz/80 MHz * I, A, V, B		**S26HL01GT** -/166 MHz * I, A, V, B, M	**S28HL01GT** 166 MHz/166 MHz * I, A, V, B, M	**S79FS01GS** 133 MHz/102 MHz * I, A, V, B		**S26HS01GT** -/200 MHz * I, A, V, B, M[6]	**S28HS01GT[6]** 200 MHz/200 MHz * I, A, V, B, M
	S79FL512S 133 MHz/80 MHz * I, A, V, B	**S26KL512S** -/100 MHz * I, A, V, B, M	**S26HL512T** -/166 MHz * I, A, V, B, M	**S28HL512T** 166 MHz/166 MHz * I, A, V, B, M	**S79FS512S** 133 MHz/80 MHz * I, A, V, B	**S26KS512S** -/166 MHz * I, A, V, B, M	**S26HS512T** -/200 MHz * I, A, V, B, M	**S28HS512T** 200 MHz/200 MHz * I, A, V, B, M
	S79FL256S 133 MHz/80 MHz * I, A, V, B	**S26KL256S** -/100 MHz * I, A, V, B, M	Q421 **S26HL256T[6]** Q322 -/166 MHz * I, A, V, B, M	Q421 **S28HL256T[6]** Q222 166 MHz/166 MHz * I, A, V, B, M	**S79FS256S** 133 MHz/80 MHz * I, A, V, B	**S26KS256S** -/166 MHz * I, A, V, B, M	Q421 **S26HS256T[6]** Q322 -/200 MHz * I, A, V, B, M	Q421 **S28HS256T[6]** Q222 200 MHz/200 MHz * I, A, V, B, M
64–128Mb		**S26KL128S** -/100 MHz * I, A, V, B, M	**S26HL128T** -/166 MHz * I, A, V, B, M	**S28HL128T** 166 MHz/166 MHz * I, A, V, B, M		**S26KS128S** -/166 MHz * I, A, V, B, M	**S26HS128T** -/200 MHz * I, A, V, B, M	**S28HS128T** 200 MHz/200 MHz * I, A, V, B, M

[1] Hybrid Sector
[2] S79 series (stacked die)
[3] HYPERBUS™ Interface (xSPI Profile 2.0)
[4] Octal Interface (xSPI Profile 1.0)
[5] Stacked die
[6] Contact Sales

* I = Industrial: -40°C to +85°C
A = Automotive, AEC-Q100 Grade 3: -40°C to +85°C
V = Industrial-plus: -40°C to +105°C
B = Automotive, AEC-Q100 Grade 2: -40°C to +105°C
M = Automotive, AEC-Q100 Grade 1: -40°C to +125°C

	Concept	Development	Sampling	Production
Status				
Availability			QQYY	QQYY
EOL (Last-Time-Ship)				QQYY

x4 Serial NOR Flash Memory Roadmap

Product Family	Density	(Prod) [EOL]	2021[8]				2022				2023				2024				2025			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
S25HS-T (1.8 V) S25HL-T (3.0 V) SEMPER™ Flash with QSPI Interface 45-nm MB[2]	4Gb[4] 2Gb[4] 1Gb 512Mb 256Mb 128Mb	(TBD) (TBD) (TBD)																				
S25FS-S (1.8 V) S25FL-S[3] (3.0V) QSPI 65-nm MB[2]	1Gb[5] 512Mb 256Mb 128Mb[6] 64Mb[7]																					
S25FL-L (3.0 V) QSPI 65-nm FG[1]	256Mb 128Mb 64Mb																					
SFM3204A (0.85-2.75 V) QSPI 40-nm eFG[1, 9]	32Mb																					

[1] Uniform Sector
[2] Hybrid Sector
[3] VIO 1.8 V to 3.0 V
[4] Stacked die
[5] S70 Series (stacked die)
[6] S25FL127S & S25FL128S
[7] FS-S only
[8] Calendar Year
[9] Embedded FG

Products supported by Longevity Program unless noted

Concept
Samples
Production
EOL - LTB
EOL - LTS

x4 Serial NOR Flash Memory Portfolio

	QSPI S25FL-L[1] 65-nm FG, 3.0 V	QSPI S25FL-S[2] 65-nm MB, 3.0 V	SEMPER™ Flash[3] S25HL-T[2] 45-nm MB, 3.0 V	QSPI S25FS-S[2] 65-nm MB, 1.8 V	SEMPER Flash[3] S25HS-T[2] 45-nm MB, 1.8 V	Specialty LP SFM3204A[1] 40-nm eFG[8], 0.85-2.75 V
≥256Mb	**Product Family Number** SDR Clock/DDR Clock * Temperature Range All parts supported by Longevity Program unless noted	**S70FL01GS**[5] 133 MHz/80 MHz * I, A, V, B, M	**S25HL04GT**[4, 6] 133 MHz/66 MHz * I, A, V, B, M		**S25HS04GT**[4, 6] 133 MHz/66 MHz * I, A, V, B, M	
			S25HL02GT[4, 6] 166 MHz/102 MHz * I, A, V, B, M		**S25HS02GT**[4, 6] 133 MHz/102 MHz * I, A, V, B, M	
			S25HL01GT 166 MHz/102 MHz * I, A, V, B, M	**S70FS01GS**[5] 133 MHz/80 MHz * I, A, V, B, M	**S25HS01GT** 166 MHz/102 MHz * I, A, V, B, M	
		S25FL512S 133 MHz/80 MHz * I, A, V, B, M	**S25HL512T** 166 MHz/102 MHz * I, A, V, B, M	**S25FS512S** 133 MHz/80 MHz * I, A, V, B, M	**S25HS512T** 166 MHz/102 MHz * I, A, V, B, M	
	S25FL256L 133 MHz/66 MHz * I, A, V, B, M	**S25FL256S** 133 MHz/80 MHz * I, A, V, B, M	**S25HL256T** 166 MHz/102 MHz * I, A, V, B, M	**S25FS256S** 133 MHz/80 MHz * I, A, V, B, M	**S25HS256T** 166 MHz/102 MHz * I, A, V, B, M	
32–128Mb	**S25FL128L** 133 MHz/66 MHz * I, A, V, B, M	**S25FL128S** 133 MHz/80 MHz * I, A, V, B, M	**S25HL128T** 166 MHz/102 MHz * I, A, V, B, M	**S25FS128S** 133 MHz/80 MHz * I, A, V, B, M	**S25HS128T** 166 MHz/102 MHz * I, A, V, B, M	
		S25FL127S 108 MHz/-- * I, A, V, B				
	S25FL064L 108 MHz/54 MHz * I, A, V, B, M			**S25FS064S** 133 MHz/80 MHz * I, A, V, B, N, M		**SFM3204A** 10 MHz/-- * C[7]

[1] Uniform Sector
[2] Hybrid Sector
[3] With QSPI
[4] Stacked die
[5] S70 series (stacked die)
[6] Contact Sales
[7] 0°C to +55°C
[8] Embedded FG

* C = Commercial: 0°C to +70°C
I = Industrial: -40°C to +85°C
A = Automotive, AEC-Q100 Grade 3: -40°C to +85°C
V = Industrial-plus: -40°C to +105°C
B = Automotive, AEC-Q100 Grade 2: -40°C to +105°C
M = Automotive, AEC-Q100 Grade 1: -40°C to +125°C

	Concept	Development	Sampling	Production
Status				
Availability			QQYY	QQYY
EOL (Last-Time-Ship)				QQYY

SEMPER™ Secure Serial NOR Flash Memory Roadmap

Product Family	Density	(Prod) [EOL]	2021[3]				2022				2023				2024				2025			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
S35HS-T (1.8 V) S35HL-T (3.0 V) SEMPER™ Secure Flash with QSPI Interface 45-nm MB[2]	1Gb 512Mb 256Mb 128Mb	(TBD) (Q423) (Q122) (Q223)																				
S36HS-T[1] (1.8 V) S36HL-T[1] (3.0 V) SEMPER™ Secure Flash with HYPERBUS™ Interface 45-nm MB[2]	1Gb 512Mb 256Mb 128Mb	(TBD) (Q124) (Q322) (Q323)																				
S38HS-T[1] (1.8 V) S38HL-T[1] (3.0 V) SEMPER™ Secure Flash with Octal Interface 45-nm MB[2]	1Gb 512Mb 256Mb 128Mb	(TBD) (Q423) (Q222) (Q223)																				

Products supported by Longevity Program unless noted

Concept
Samples
Production
EOL - LTB
EOL - LTS

[1] JEDEC xSPI Compliant
[2] Hybrid Sector
[3] Calendar Year

SEMPER™ Secure Serial NOR Flash Memory Portfolio

	SEMPER™ Secure Flash[1] S35HL-T[2] 45-nm MB, 3.0 V	SEMPER Secure Flash[3] S36HL-T[2] 45-nm MB, 3.0 V	SEMPER Secure Flash[4] S38HL-T[2] 45-nm MB, 3.0 V	SEMPER Secure Flash[1] S35HS-T[2] 45-nm MB, 1.8 V	SEMPER Secure Flash[3] S36HS-T[2] 45-nm MB, 1.8 V	SEMPER Secure Flash[4] S38HS-T[2] 45-nm MB, 1.8 V
	All parts supported by Longevity Program unless noted	**Product Family Number** SDR Clock/DDR Clock * Temperature Range				
≥256Mb	**S35HL01GT** 166 MHz/102 MHz * I, A, V, B, M	**S36HL01GT** -/133 MHz * I, A, V, B, M	**S38HL01GT** 133 MHz/133 MHz * I, A, V, B, M	**S35HS01GT** 133 MHz/102 MHz * I, A, V, B, M	**S36HS01GT** -/166 MHz * I, A, V, B, M	**S38HS01GT** 166 MHz/166 MHz * I, A, V, B, M
	Q223 **S35HL512T** Q423 166 MHz/102 MHz * I, A, V, B, M	Q323 **S36HL512T** Q124 -/166 MHz * I, A, V, B, M	Q223 **S38HL512T** Q423 166 MHz/166 MHz * I, A, V, B, M	Q223 **S35HS512T** Q423 166 MHz/102 MHz * I, A, V, B, M	Q323 **S36HS512T** Q124 -/200 MHz * I, A, V, B, M	Q223 **S38HS512T** Q423 200 MHz/200 MHz * I, A, V, B, M
	S35HL256T Q122 166 MHz/102 MHz * I, A, V, B, M	**S36HL256T** Q322 -/166 MHz * I, A, V, B, M	**S38HL256T** Q222 166 MHz/166 MHz * I, A, V, B, M	**S35HS256T** Q122 166 MHz/102 MHz * I, A, V, B, M	**S36HS256T** Q322 -/200 MHz * I, A, V, B, M	**S38HS256T** Q222 200 MHz/200 MHz * I, A, V, B, M
64–128Mb	Q422 **S35HL128T** Q223 166 MHz/102 MHz * I, A, V, B, M	Q123 **S36HL128T** Q323 -/166 MHz * I, A, V, B, M	Q422 **S38HL128T** Q223 166 MHz/166 MHz * I, A, V, B, M	Q422 **S35HS128T** Q223 166 MHz/102 MHz * I, A, V, B, M	Q123 **S36HS128T** Q323 -/200 MHz * I, A, V, B, M	Q422 **S38HS128T** Q223 200 MHz/200 MHz * I, A, V, B, M

[1] With QSPI
[2] Hybrid Sector
[3] HYPERBUS™ Interface (xSPI Profile 2.0)
[4] Octal Interface (xSPI Profile 1.0)

* I = Industrial: -40°C to +85°C
A = Automotive, AEC-Q100 Grade 3: -40°C to +85°C
V = Industrial-plus: -40°C to +105°C
B = Automotive, AEC-Q100 Grade 2: -40°C to +105°C
M = Automotive, AEC-Q100 Grade 1: -40°C to +125°C

	Concept	Development	Sampling	Production
Status				
Availability			QQYY	QQYY
EOL (Last-Time-Ship)				QQYY

Parallel NOR Flash Memory Roadmap

Product Family	Density	(Prod) [EOL]	2021[4]				2022				2023				2024				2025			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
S29GL-T[1] (3.0 V) 45-nm MB	2Gb[3] 1Gb 512Mb																					
S29GL-S[1] (3.0 V) 65-nm MB	2Gb[3] 1Gb 512Mb 256Mb 128Mb 64Mb																					
S29GL-P[1] (3.0 V) 90-nm MB	256Mb 128Mb																					
S29GL-N[1] (3.0 V) 110-nm MB	64Mb 32Mb	[Q422] [Q422]																				
S29PL-J[1, 2] (3.0 V) 110-nm FG	128Mb 64Mb 32Mb																					
S29JL-J[2] (3.0 V) 110-nm FG	64Mb 32Mb																					
S29AL-J (3.0 V) 110-nm FG	16Mb 8Mb																					
S29AS-J (1.8 V) 110-nm FG	16Mb																					

[1] Supports Page Mode
[2] Supports simultaneous read/write operation
[3] S70 series (stacked die)
[4] Calendar Year

Products supported by Longevity Program unless noted

Concept
Samples
Production
EOL - LTB
EOL - LTS

Parallel NOR Flash Memory Portfolio

	S29AS-J 110-nm FG, 1.8 V	S29AL-J 110-nm FG, 3.0 V	S29JL-J[1] 110-nm FG, 3.0 V	S29PL-J[1, 2] 110-nm FG, 3.0 V	S29GL-N[2] 110-nm MB, 3.0 V	S29GL-P[2] 90-nm MB, 3.0 V	S29GL-S[2] 65-nm MB, 3.0 V	S29GL-T[2] 45-nm MB, 3.0 V
≥256Mb	**Product Family Number** Initial/Page Access * Temperature Range All parts supported by Longevity Program unless noted						**S70GL02GS[3]** 110 ns/20 ns * I, A, V, B **S29GL01GS** 100 ns/15 ns * I, A, V, B **S29GL512S** 100 ns/15 ns * I, A, V, B **S29GL256S** 90 ns/15 ns * I, A, V, B	**S70GL02GT[3]** 110 ns/20 ns * I, A, V, B, N **S29GL01GT** 100 ns/15 ns * I, A, V, B, N **S29GL512T** 100 ns/15 ns * I, A, V, B, N
						S29GL256P 90 ns/25 ns * I		
64–128Mb				**S29PL128J** 60 ns/20 ns * I, A		**S29GL128P** 90 ns/25 ns * I	**S29GL128S** 90 ns/15 ns * I, A, V, B	
			S29JL064J 55 ns/-- * I, A	**S29PL064J** 55 ns/20 ns * I, A	**S29GL064N** Q422 90 ns/25 ns * I, A		**S29GL064S** 70 ns/15 ns * I, A, B	
≤32Mb	**S29AS016J** 70 ns/-- * I, A	**S29AL016J** 55 ns/-- * I, A, N, M **S29AL008J** 55 ns/-- * I, A, N, M	**S29JL032J** 60 ns/-- * I, A	**S29PL032J** 55 ns/20 ns * I, A	**S29GL032N** Q422 90 ns/25 ns * I, A			

[1] Supports simultaneous read/write operation
[2] Supports Page Mode
[3] S70 series (stacked die)

* I = Industrial: -40°C to +85°C
V = Industrial-plus: -40°C to +105°C
N = Extended: -40°C to +125°C

A = Automotive, AEC-Q100 Grade 3: -40°C to +85°C
B = Automotive, AEC-Q100 Grade 2: -40°C to +105°C
M = Automotive, AEC-Q100 Grade 1: -40°C to +125°C

	Concept	Development	Sampling	Production
Status				
Availability			QQYY	QQYY
EOL (Last-Time-Ship)				QQYY

Burst NOR Flash Memory Roadmap

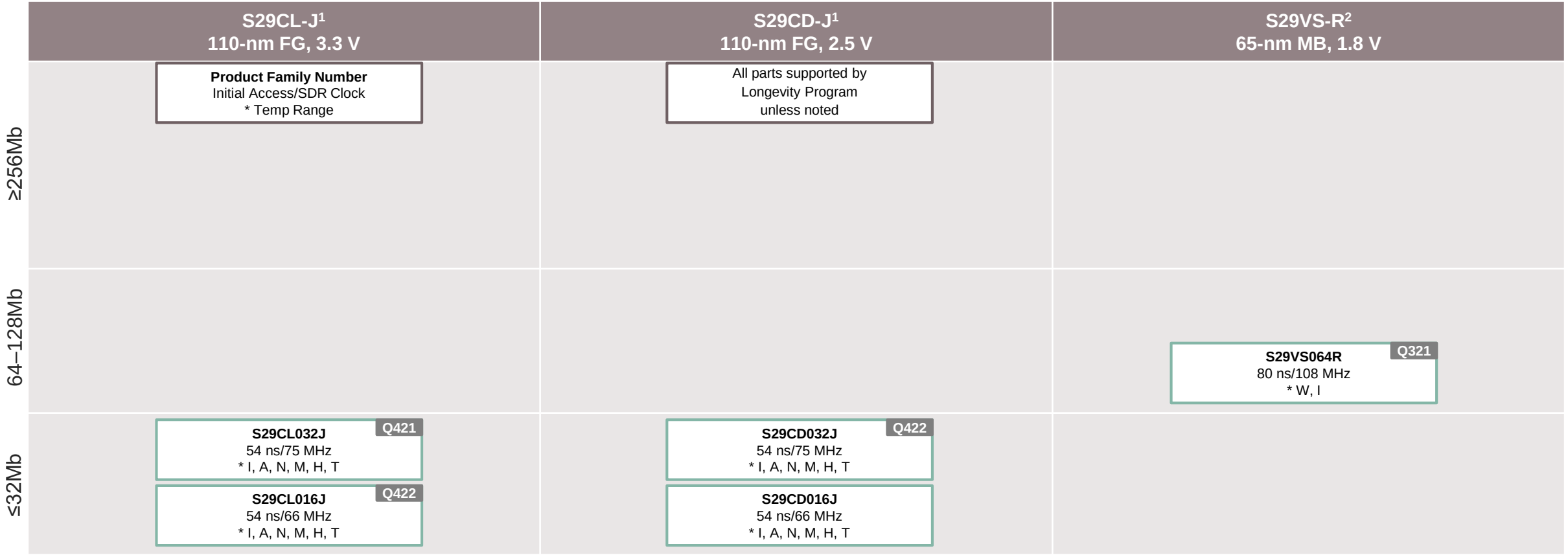
Product Family	Density	(Prod) [EOL]	2021[3]				2022				2023				2024				2025			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
S29VS-R[2] (1.8 V) 65-nm MB	64Mb	[Q321]																				
S29CD-J[1] (2.5 V) 110-nm FG	32Mb	[Q422]																				
S29CD-J[1] (2.5 V) 110-nm FG	16Mb																					
S29CL-J[1] (3.3 V) 110-nm FG	32Mb	[Q421]																				
S29CL-J[1] (3.3 V) 110-nm FG	16Mb	[Q422]																				

[1] Address Data Parallel (ADP) Burst
[2] Address Data Multiplex (ADM) Burst
[3] Calendar Year

Products supported by Longevity Program unless noted

Concept
Samples
Production
EOL - LTB
EOL - LTS

Burst NOR Flash Memory Portfolio



[1] Address Data Parallel (ADP) Burst
[2] Address Data Multiplex (ADM) Burst

* W = Wireless: -25°C to +85°C
I = Industrial: -40°C to +85°C
A = Automotive, AEC-Q100 Grade 3: -40°C to +85°C
N = Extended: -40°C to +125°C
M = Automotive, AEC-Q100 Grade 1: -40°C to +125°C
T = Automotive, AEC-Q100 Grade 0: -40°C to +150°C

	Concept	Development	Sampling	Production
Status				
Availability			QQYY	QQYY
EOL (Last-Time-Ship)				QQYY

KGD/KGW NOR Flash Memory Portfolio[1]

	HYPERFLASH™ 3.0 V	HYPERFLASH™ 1.8 V	Quad SPI 3.0 V	Quad SPI 1.8 V	Parallel 3.0 V
≥256Mb	**Product Family Number** SDR Clock/DDR Clock * Temperature Range All parts supported by Longevity Program unless noted **S26KL512S** -/100 MHz * I, V **S26KL256S** -/100 MHz * I, V	**S26KS512S** -/166 MHz * I, V **S26KS256S** -/166 MHz * I, V	**S25FL512S** 133 MHz/80 MHz * I, V **S25FS256L** 133 MHz/66 MHz * I, V	**S25FS256S** 80 MHz /- * I, V	**Product Family Number** Initial/Page Access * Temperature Range **S29GL01GS** 100 ns/15 ns * I, V **S29GL512S** 100 ns/15 ns * I, V **S29GL256S** 90 ns/15 ns * I, V
64–128Mb	**S26KL128S** -/100 MHz * I, V	**S26KS128S** -/166 MHz * I, V	**S25FL128L** 133 MHz/66 MHz * I, V **S25FL064L** 108 MHz/54 MHz * I, V	**S25FS128S** 133 MHz/80 MHz * I, V **S25FS064S** 133 MHz/80 MHz * I, V, N	**S29GL128S** 90 ns/15 ns * I, V
≤32Mb					**S29AL016J** 55 ns/- * I, V, N **S29AL008J** 55 ns/- * I, V, N

	Concept	Development	Sampling	Production
Status				
Availability			QQYY	QQYY
EOL (Last-Time-Ship)				QQYY

[1] Contact Sales for KGD datasheets

* C= Commercial: 0°C to +70°C
I = Industrial: -40°C to +85°C
V = Industrial-plus: -40°C to +105°C
N = Extended: -40°C to +125°C
All temperature grades are T_J

Flash and RAM Memory Multi-chip Package (MCP)

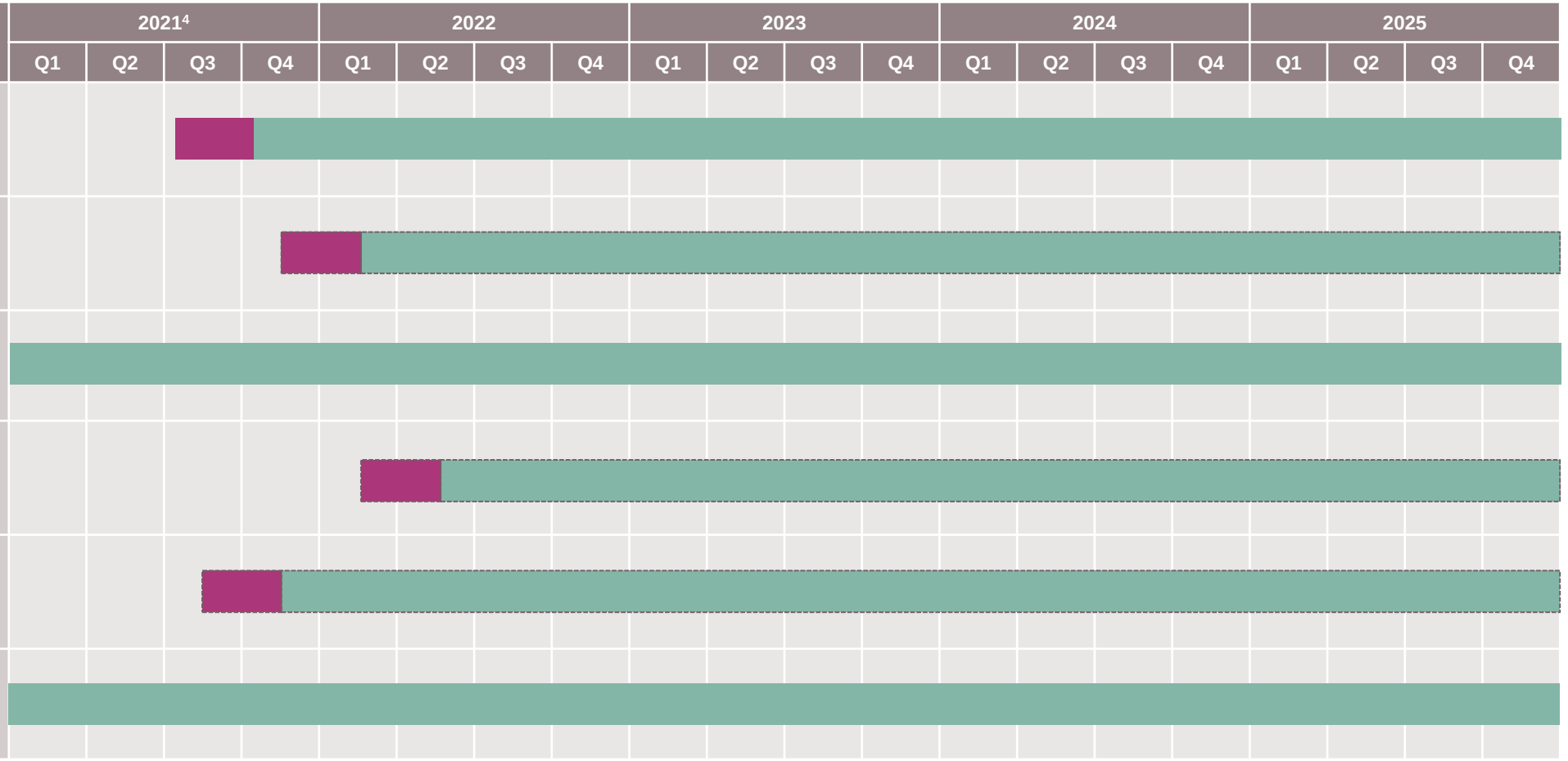
Flash and RAM Memory MCP Decoder

S 76 H S 512 T C

RAM Density:	A = 16Mb	B = 32Mb	C = 64Mb	D = 128Mb	E = 256Mb
Flash Technology:	P = 90-nm MB	R, S = 65-nm MB	T = 45-nm MB		
Flash Density:	032 = 32Mb	128 = 128Mb	512 = 512Mb		
	064 = 64Mb	256 = 256Mb	01G = 1Gb		
Voltage:	L = 3.0 V	S = 1.8 V			
Family:	G = Page Mode				
	H = High-Performance Serial				
	K = HYPERFLASH™				
	V = Burst Mode Simultaneous Read/Write Address-Data Multiplexed (ADM)				
	W = Burst Mode Simultaneous Read/Write Address-Data Parallel (ADP)				
	X = Burst Mode Simultaneous Read/Write Address-Address-Data Multiplexed (AADM)				
Series:	71, 98 = NOR Flash + pSRAM				
	72 = NOR Flash + DRAM				
	76 = HYPERBUS™ Interface (xSPI Profile 2.0) NOR Flash + HYPERRAM™				
	78 = Octal Interface (xSPI Profile 1.0) NOR Flash + HYPERRAM™				
Prefix:	S				

Serial Flash and RAM Memory MCP Roadmap

Product Family Flash/RAM	Flash/RAM Density	(Prod) [EOL]
S78HS-T (1.8 V)[1] 45-nm SEMPER™ Flash/HYPERRAM	1Gb/128Mb	(TBD)
	1Gb/64Mb	(TBD)
	512Mb/128Mb	(TBD)
	512Mb/64Mb	(Q421)
S76HS-T (1.8 V)[2] 45-nm SEMPER Flash/HYPERRAM	1Gb/128Mb	(TBD)
	1Gb/64Mb	(Q122)
	512Mb/128Mb	(TBD)
	512Mb/64Mb	(TBD)
S71KS-S (1.8 V)[3] 65-nm HYPERFLASH/ HYPERRAM	512Mb/64Mb	
	256Mb/64Mb	(TBD)
	128Mb/64Mb	(TBD)
S78HL-T (3.0 V)[1] 45-nm SEMPER Flash/HYPERRAM	1Gb/128Mb	(TBD)
	1Gb/64Mb	(Q222)
	512Mb/128Mb	(TBD)
	512Mb/64Mb	(TBD)
S76HL-T (3.0 V)[2] 45-nm SEMPER Flash/HYPERRAM	1Gb/128Mb	(TBD)
	1Gb/64Mb	(TBD)
	512Mb/128Mb	(TBD)
	512Mb/64Mb	(Q421)
S71KL-S (3.0 V)[3] 65-nm HYPERFLASH/ HYPERRAM	512Mb/64Mb	
	256Mb/64Mb	
	128Mb/64Mb	(TBD)

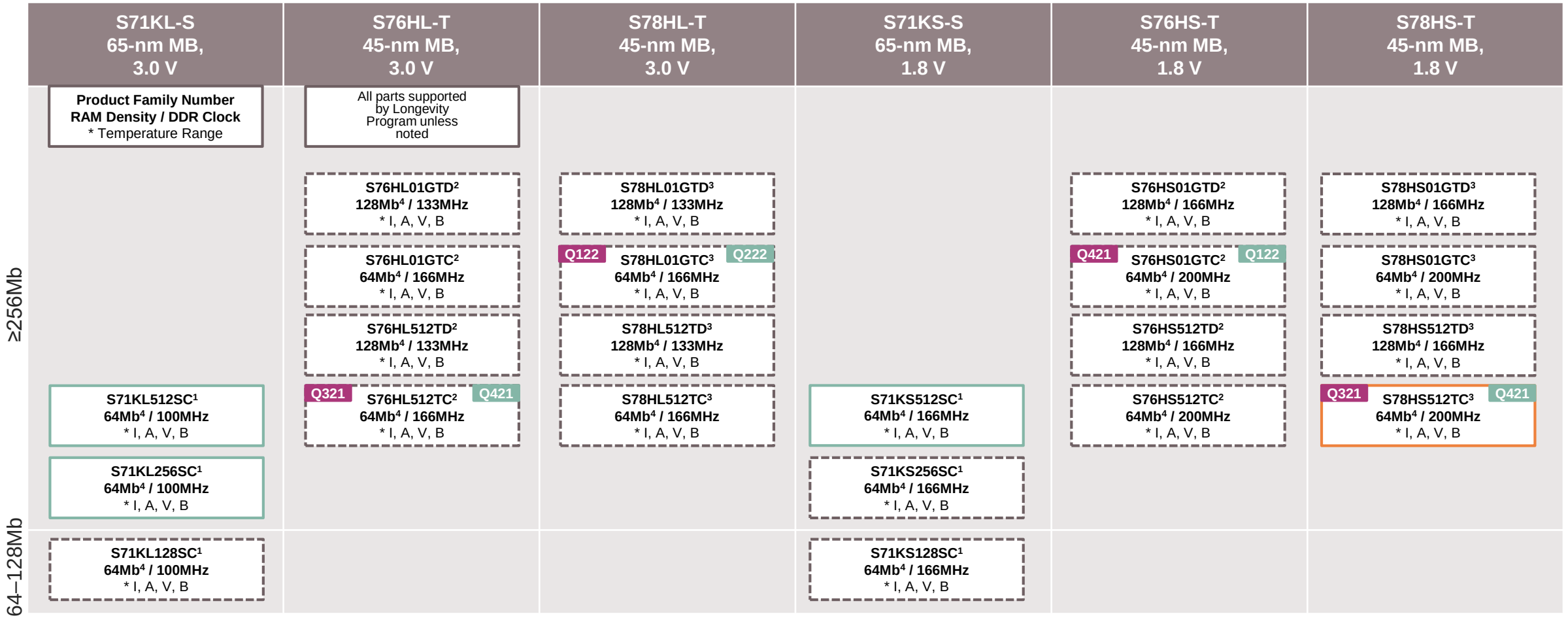


[1] Octal Interface (xSPI Profile 1.0)
[2] HYPERBUS™ Interface (xSPI Profile 2.0)
[3] HYPERBUS™ Interface
[4] Calendar Year

Products supported by Longevity Program unless noted

Concept
Samples
Production
EOL - LTB
EOL - LTS

Serial Flash and RAM Memory MCP Portfolio



[1] HYPERFLASH™
[2] HYPERBUS™ Interface (xSPI Profile 2.0)
[3] Octal Interface (xSPI Profile 1.0)
[4] HYPERRAM™

* I = Industrial: -40°C to +85°C
A = Automotive, AEC-Q100 Grade 3: -40°C to +85°C
V = Industrial-plus: -40°C to +105°C
B = Automotive, AEC-Q100 Grade 2: -40°C to +105°C

	Concept	Development	Sampling	Production
Status				
Availability			QQYY	QQYY
EOL (Last-Time-Ship)				QQYY

Parallel Flash and RAM Memory MCP Roadmap

Product Family Flash/RAM	Flash/RAM Density	(Prod) [EOL]	2021[1]				2022				2023				2024				2025			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
S72XS-R (1.8 V) 65-nm MB/DRAM	256Mb/256Mb	[Q321]																				
S71VS-R (1.8 V) 65-nm MB/pSRAM	256Mb/128Mb 256Mb/64Mb 128Mb/64Mb 128Mb/32Mb	[Q321] [Q321] [Q321] [Q321]																				
S71WS-P (1.8 V) 90-nm MB/pSRAM	256Mb/64Mb																					

[1] Calendar Year

Products supported by Longevity Program unless noted

- Concept
- Samples
- Production
- EOL - LTB
- EOL - LTS

Parallel Flash and RAM Memory MCP Portfolio

	S71WS-P[1] 90-nm MB, 1.8 V	S71VS-R[2] 65-nm MB, 1.8 V	S72XS-R[3] 65-nm MB, 1.8 V
≥256Mb	**Product Family Number** **RAM Density** * Temperature Range	All parts supported by Longevity Program unless noted	**S72XS256RE** Q321 **256Mb[5]** * I
≥256Mb	**S71WS256PC** **64Mb** * W	**S71VS256RD** Q321 **128Mb** * W **S71VS256RC** Q321 **64Mb** * W	**S72XS256RE** Q321 **256Mb[6]** * W, I
64–128Mb		**S71VS128RC** Q321 **64Mb** * W **S71VS128RB** Q321 **32Mb** * W	

[1] Address Data Parallel (ADP) Burst
[2] Address Data Multiplex (ADM) Burst
[3] Address High, Address Low, Data Multiplex (AADM) Burst
[4] Parallel, Page Mode

[5] DRAM Version 2
[6] DRAM Version 1

* W = Wireless: -25°C to +85°C
I = Industrial: -40°C to +85°C

	Concept	Development	Sampling	Production
Status				
Availability			QQYY	QQYY
EOL (Last-Time-Ship)				QQYY

Package Offerings

x8 1.8V Serial Memory Packages

Family	Interface	Series	Density	Device	SOIC-16 300 mil	BGA24 8 x 8 mm/5 x 5 Ball	BGA24 8 x 6 mm/5 x 5 Ball	KGD
SEMPER™ Flash	Octal	HS-T[1]	256Mb	S28HS256T			CF	CF
			512Mb	S28HS512T			✓	CF
			1Gb	S28HS01GT		✓		CF
			2Gb	S28HS02GT		✓		
			4Gb	S28HS04GT		CF		
	HYPERBUS	HS-T[2]	256Mb	S26HS256T			CF	CF
			512Mb	S26HS512T			✓	CF
			1Gb	S26HS01GT		✓		CF
			2Gb	S26HS02GT		CF		
			4Gb	S26HS04GT		CF		
HYPERFLASH™		KS-S[3]	128Mb	S26KS128S			✓	CF
			256Mb	S26KS256S			✓	CF
			512Mb	S26KS512S			✓	CF
Quad SPI	QSPI	FS-S Dual Quad	256Mb	S79FS256S	CF		CF	
			512Mb	S79FS512S	CF		CF	
			1Gb	S79FS01GS			✓	

[1] Octal Interface (xSPI Profile 1.0)
[2] HYPERBUS™ Interface (xSPI Profile 2.0)
[3] HYPERBUS™ Interface

CF = Contact Factory
UD = Under Development

x8 3.0V Serial Memory Packages

Family	Interface	Series	Density	Device	SOIC-16 300 mil	BGA24 8 x 8 mm/5 x 5 Ball	BGA24 8 x 6 mm/5 x 5 Ball	KGD
SEMPER™ Flash	Octal	HL-T[1]	256Mb	S28HL256T			CF	CF
			512Mb	S28HL512T			✓	CF
			1Gb	S28HL01GT		✓		CF
			2Gb	S28HL02GT		CF		
			4Gb	S28HL04GT		CF		
	HYPERBUS	HL-T[2]	256Mb	S26HL256T			CF	CF
			512Mb	S26HL512T			✓	CF
			1Gb	S26HL01GT		✓		CF
			2Gb	S26HL02GT		CF		
			4Gb	S26HL04GT		CF		
HYPERFLASH™		KL-S[3]	128Mb	S26KL128S			✓	CF
			256Mb	S26KL256S			✓	CF
			512Mb	S26KL512S			✓	CF
Quad SPI	QSPI	FL-S Dual Quad	256Mb	S79FL256S	✓			
			512Mb	S79FL512S	✓			
			1Gb	S79FL01GS			✓	

[1] Octal Interface (xSPI Profile 1.0)
[2] HYPERBUS™ Interface (xSPI Profile 2.0)
[3] HYPERBUS™ Interface

CF = Contact Factory
UD = Under Development

x4 Serial NOR Flash Memory Packages

Family	Interface	Series	Density	Device	SOIC-8 208 mil	SOIC-16 300 mil	WSON 4 x 4 mm	WSON 6 x 5 mm	WSON 8 x 6 mm	BGA24 8 x 8 mm 5 x 5 Ball	BGA24 8 x 6 mm 5 x 5 Ball	BGA24 8 x 6 mm 4 x 6 Ball	KGD	WLCSP
SEMPER™ Flash	QSPI	HS-T	256Mb	S25HS256T		CF			CF		CF		CF	
			512Mb	S25HS512T		✓			✓		✓		CF	
			1Gb	S25HS01GT		✓				✓			CF	
			2Gb	S25HS02GT						✓				
			4Gb	S25HS04GT						CF				
		HL-T	256Mb	S25HL256T		CF			CF		CF		CF	
			512Mb	S25HL512T		✓			✓		✓		CF	
			1Gb	S25HL01GT		✓				✓			CF	
			2Gb	S25HL02GT						✓				
			4Gb	S25HL04GT						CF				
Quad SPI		FS-S	64Mb	S25FS064S	✓			✓			✓		✓	
			128Mb	S25FS128S	✓	CF		✓	✓		✓	✓	CF	
			256Mb	S25FS256S		✓			✓		✓	✓	✓	
			512Mb	S25FS512S		✓			✓		✓	✓	CF	
			1Gb	S70FS01GS		✓					✓			
		FL-S	128Mb	S25FL127S	✓	✓		✓			✓	✓		
			128Mb	S25FL128S		✓			✓		✓	✓		
			256Mb	S25FL256S		✓			✓		✓	✓		
			512Mb	S25FL512S		✓					✓	✓	✓	
			1Gb	S70FL01GS		✓					✓			
		FL-L	64Mb	S25FL064L	✓	✓	✓	✓			✓	✓	CF	
			128Mb	S25FL128L	✓	✓		✓			✓	✓	CF	
			256Mb	S25FL256L		✓			✓		✓	✓	CF	

CF = Contact Factory
UD = Under Development

SEMPER™ Secure Serial NOR Flash Memory Packages

Family	Interface	Series	Density	Device	SOIC-16 300 mil	WSON 8 x 6 mm	BGA24 8 x 8 mm 5 x 5 Ball	BGA24 8 x 6 mm 5 x 5 Ball	KGD
SEMPER™ Secure Flash	QSPI	HS-T	128Mb	S35HS128T	CF	CF		CF	CF
			256Mb	S35HS256T	✓	UD		✓	CF
			512Mb	S35HS512T			CF		CF
			1Gb	S35HS01GT			CF		
		HL-T	128Mb	S35HL128T	CF	CF		CF	CF
			256Mb	S35HL256T	✓	UD		✓	CF
			512Mb	S35HL512T			CF		CF
			1Gb	S35HL01GT			CF		
	HYPERBUS	HS-T	128Mb	S36HS128T				CF	CF
			256Mb	S36HS256T				✓	CF
			512Mb	S36HS512T			CF		CF
			1Gb	S36HS01GT			CF		
		HL-T	128Mb	S36HL128T				CF	CF
			256Mb	S36HL256T				✓	CF
			512Mb	S36HL512T			CF		CF
			1Gb	S36HL01GT			CF		
	Octal	HS-T	128Mb	S38HS128T				CF	CF
			256Mb	S38HS256T				✓	CF
			512Mb	S38HS512T			CF		CF
			1Gb	S38HS01GT			CF		
		HL-T	128Mb	S38HL128T				CF	CF
			256Mb	S38HL256T				✓	CF
			512Mb	S38HL512T			CF		CF
			1Gb	S38HL01GT			CF		

CF = Contact Factory
UD = Under Development

Parallel NOR Flash Memory Packages

Family	Density	Device	48-Ball FBGA (0.8-mm pitch)	48-Ball FBGA (0.5-mm pitch)	56-Ball BGA (0.8-mm pitch)	64-Ball BGA (0.8-mm pitch)	64-Ball Fortified BGA (1.0-mm pitch)	48-Pin TSOP	56-Pin TSOP	KGD
GL-T	512Mb	S29GL512T			✓		✓		✓	
	1Gb	S29GL01GT			✓		✓		✓	
	2Gb	S70GL02GT					✓			
GL-S	64Mb	S29GL064S	✓				✓	✓	✓	
	128Mb	S29GL128S			✓		✓		✓	✓
	256Mb	S29GL256S			✓		✓		✓	✓
	512Mb	S29GL512S			✓		✓		✓	✓
	1Gb	S29GL01GS					✓		✓	✓
	2Gb	S70GL02GS					✓			
GL-P	128Mb	S29GL128P					✓		✓	✓
	256Mb	S29GL256P					✓		✓	✓
GL-N	32Mb	S29GL032N	EOL				EOL	EOL	EOL	EOL
	64Mb	S29GL064N	EOL				EOL	EOL	EOL	EOL
PL-J	32Mb	S29PL032J	✓		✓					
	64Mb	S29PL064J	✓		✓					
	128Mb	S29PL127J				✓			✓	✓
JL-J	32Mb	S29JL032J	✓					✓		
	64Mb	S29JL064J	✓					✓		✓
AL-J	8Mb	S29AL008J	✓					✓		✓
	16Mb	S29AL016J	✓				✓	✓		✓
AS-J	16Mb	S29AS016J	✓	✓				✓		✓

Burst NOR Flash Memory Packages

Family	Density	Device	44-Ball FBGA (0.5-mm pitch)	64-Ball BGA (0.5-mm pitch)	84-Ball Fortified BGA (0.8-mm pitch)	80-Ball FBGA (1.0-mm pitch)	80-Pin PQFP	KGD
VS-R	64Mb	S29VS064R	EOL					
CD-J	16Mb	S29CD016J				✓	✓	✓
	32Mb	S29CD032J				EOL	EOL	
CL-J	16Mb	S29CL016J				EOL	EOL	
	32Mb	S29CL032J				EOL	EOL	

Flash and RAM Memory MCP Packages

Family	Flash Density	RAM Density	BGA24 8 x 6 mm 5 x 5 Ball	BGA24 8 x 8 mm 5 x 5 Ball	56-Ball Very Thin FBGA (0.5-mm pitch)	56-Ball FBGA (0.8-mm pitch)	84-Ball FBGA (0.8-mm pitch)	133-Ball FBGA (0.5-mm pitch)
S76HS-T S76HL-T	512Mb	64Mb		CF				
	512Mb	128Mb		CF				
	1Gb	64Mb		CF				
	1Gb	128Mb		CF				
S78HS-T S78HL-T	512Mb	64Mb		UD				
	512Mb	128Mb		CF				
	1Gb	64Mb		CF				
	1Gb	128Mb		CF				
S71KS-S	128Mb	64Mb	✓					
	256Mb	64Mb	✓					
	512Mb	64Mb	✓					
S71KL-S	128Mb	64Mb	✓					
	256Mb	64Mb	✓					
	512Mb	64Mb	✓					
S72XS-R	256Mb	256Mb						EOL
S71VS-R	256Mb	128Mb			EOL			
	256Mb	64Mb			EOL			
	128Mb	64Mb			EOL			
	128Mb	32Mb			EOL			
S71WS-P	256Mb	64Mb					✓	

CF = Contact Factory
UD = Under Development

SEMPER™ Solution Development Kit (SDK)

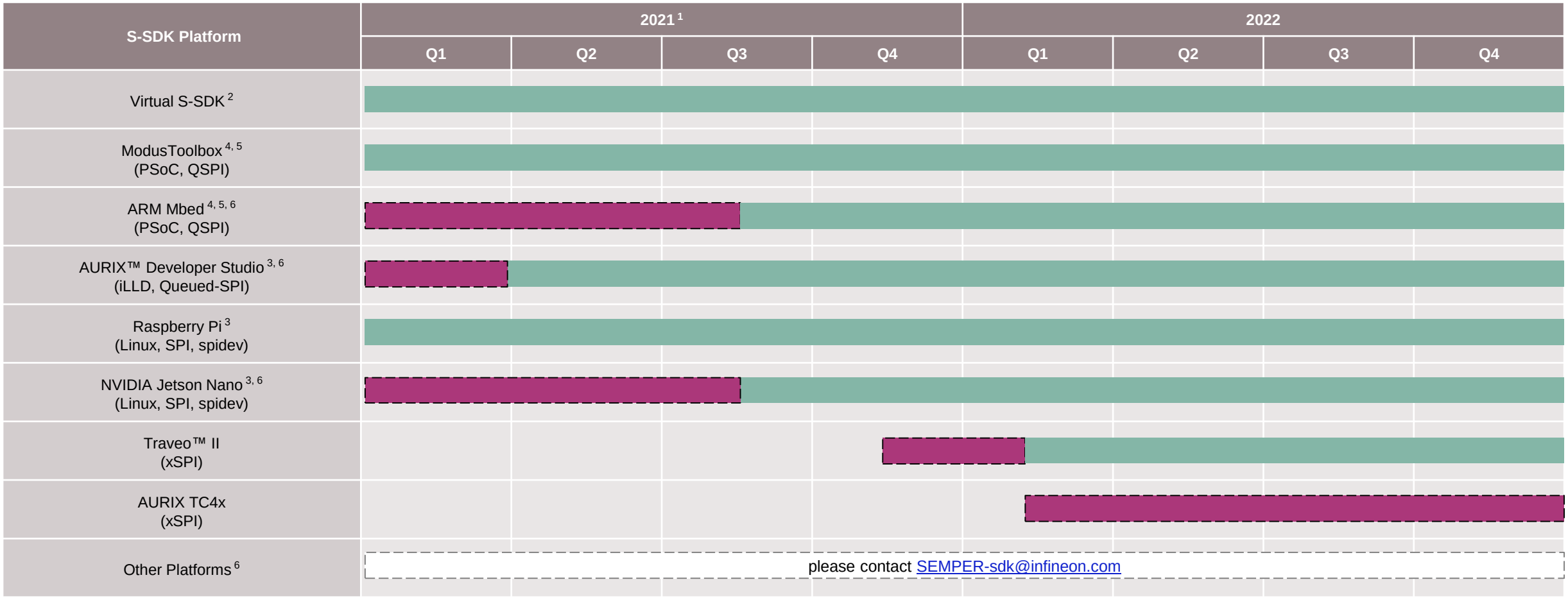
SEMPER™ SDK – portfolio

S-SDK Package	2021 [1]				2022			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	all S-SDK packages receive regular updates for bugfixes and new features, for more details please contact SEMPER-sdk@infineon.com							
BASE [2, 3, 4] (Flash Device Driver)	sampling			release	release	release	release	release
SAFE [2, 4] (Flash and Fusa Drivers)		sampling		release	release	release	release	release
SECURE [4] (Flash, Fusa and Secure Drivers)	sampling	sampling	sampling	sampling	release	release	release	release

[1] Calendar Year
[2] SEMPER
[3] SEMPER Nano
[4] SEMPER Secure

release sampling

SEMPER™ SDK – platform enablement



[1] Calendar Year
[2] Secure Driver only, Linux, C-Model
[3] SW Crypto Library (wolfSSL's wolfCrypt)
[4] SW Crypto Library (ARM Mbed TLS)
[5] SW Crypto Library (ARM Mbed Crypto)
[6] Please contact SEMPER-sdk@infineon.com

release
plan
sampling
request

SEMPER™ SDK – starter kits and Flash modules

SEMPER Secure Starter Kits	SEMPER Starter Kits	SEMPER Family Flash Memory Modules
S35HL256T Q122 **AURIX™**, PMOD TC275 Lite Kit	**S25HL512T**[1,2] **PSoC 64** CY8CPROTO-064S1-SB	**PMOD** **Octal / HYPERBUS SPI** 24-ball BGA 6x8mm
S35HL256T[2] Q122 **AURIX** TC375 Lite Kit	**S25HL512T**[1,2] **PSoC 64** CY8CPROTO-064B0S3	**PMOD** **Quad SPI** 24-ball BGA 6x8mm
S35HL256T[1,2] Q122 **PSoC 64**, Symmetric CY8CPROTO-064B0S1-SSS	**S25HL512T** **AURIX**, Click TC275 Lite Kit	**PMOD** **Quad SPI** WLCSP
S35HL256T[1,2] Q122 **PSoC 64**, Asymmetric CY8CPROTO-064B0S1-SSA	**S25HL512T** **AURIX**, Click TC375 Lite Kit	**Click board™** **SEMPER FLASH CLICK**[1, 3] S25HS512T
		Click board **SEMPER FLASH 2 CLICK**[1, 3] S25HL512T
For more starter kit options contact SEMPER-sdk@infineon.com or see: https://www.cypress.com/microcontrollers-mcus-kits https://www.infineon.com/cms/en/product/microcontroller/32-bit-tricore-microcontroller/#boards		

[1] QSPI Interface
[2] Onboard flash
[3] Available from MikroElektronika

	Concept	Development	Sampling	Production
Status				
Availability			QQYY	QQYY

Part of your life. Part of tomorrow.