

:

1		3
2		22
3		41
4		47
5		62
6		72

1

2019

82

50

83%

1

2

3

1

550,719.66

638,497.18

728,990.22

821,721.62

28.55%

25.00%

30.69%

34.05%

1

3

60-120

AMS90

OA120

AMS

1

OA

AMS60

OA90

AMS120

3

84.81%

90.74%

93.48%

93.82%

2

3

2019 1-9 43.75%

1-9 34.05%

2019 9 2016-2018

	821,721.62	716,797.35	613,414.02	618,063.09
	1,055,860.68	702,150.50	728,610.53	605,976.61
	2,413,440.47	1,544,786.60	1,726,004.28	1,260,486.51
= /	43.75%	45.45%	42.21%	48.07%
= /	34.05%	46.40%	35.54%	49.03%

2016 2017 2018

34.65% 32.41% 34.96%

28.55% 25.00% 30.69%

	728,990.22	638,497.18	550,719.66
	830,272.18	827,668.78	668,294.25
	2,375,058.78	2,553,613.63	1,928,780.76
= /	34.96%	32.41%	34.65%
= /	30.69%	25.00%	28.55%

2

	821,721.62	728,990.22	638,497.18	550,719.66
	14.64%	14.17%	15.94%	-
	1,055,860.68	830,272.18	827,668.78	668,294.25
	50.38%	0.31%	23.85%	-

2017 87,777.51 15.94%

2017 23.85%

2018 90,493.04 14.17%

3 102,044.58

17.62%

	728,990.22	638,497.18	90,493.04	14.17%
3	681,285.27	579,240.69	102,044.58	17.62%
3	47,704.95	59,256.49	-11,551.54	-19.49%

2018

2018 ≥ 90

2018

90 316,961.35

38.18% 57,557.13

	830,272.18	827,609.35	2,662.83
≥ 90	316,961.35	259,404.22	57,557.13
≥ 90 %	38.18	31.34	6.84

		2017	
	52,927.02	2018	
2019	9	821,721.62	14.64%
			2019
	50.38%		

1

2019 1 1

1 2019 1 1

	100	10% 1,000
	10%	

	0%

	1	1
	3	1.00%
	4-6	5.00%
	7-12	10.00%
	1-2	30.00%
	2-3	50.00%
	3	100.00%
		0.50%
	1-90	3.00%
	91-180	25.00%
	181-360	50.00%
	360	100.00%

2 2019 1 1

2

1

2016-2018

2019 1-9

2

2018 1 1

39

2018 1 1

9

30

				30		
90						
				30		
120						
2018	1	1			9	
		39				
2019	1-9					
			2018	1	1	9

	0.02%	0.14%	0.03%	0.09%	-	-

	0.51%	0.44%	0.65%	0.17%
	-	0.13%	0.17%	0.17%
	-	0.63%	0.15%	0.29%
	1.04%	1.30%	0.65%	1.86%
	0.28%	0.11%	0.05%	0.48%

1				2019		
2		2019	9	30	2019	9 30
3		2018				
122.7		0.04%			2,020.3	0.60%
	2016	2018				2019
1-9					2019	1 1

	171.08	171.08	100.00%	-
	821,550.54	374.70	0.05%	821,175.83

	171.08	171.08	100.00%	-
	728,819.14	9,626.13	1.32%	719,193.00
	171.08	171.08	100.00%	-
	638,326.10	9,269.74	1.45%	629,056.36
	7,139.86	896.56	12.56%	6,243.30
	543,579.81	9,416.61	1.73%	534,163.20

2016 2018

3

1						
3	681,285.27	93.48%	579,240.69	90.74%	461,015.51	84.81%
4-6	43,290.52	5.94%	54,134.04	8.48%	75,394.79	13.87%
7-12	3,336.49	0.46%	4,005.95	0.63%	5,651.64	1.04%
1	727,912.28	99.88%	637,380.68	99.85%	542,061.94	99.72%
1 2	726.18	0.10%	715.71	0.11%	1,436.93	0.26%
2 3	166.85	0.02%	148.77	0.02%	80.94	0.01%

3	13.83	0.00%	80.94	0.01%	-	-
	728,819.14	100.00%	638,326.10	100.00%	543,579.81	100.00%

2019 9

374.70 2018 9,251.43
0.05% 2018 1.27%

2019

2019 9 1
99.78% 3
93.82%
9,476.06 2019
2019 1-9

2018	9,626.13	-
2019 1 1	150.07	-
= -	-9,476.06	2019 2019 1-9
2019 9	374.70	-
2019 1-9 = -	224.63	2019 1-9

2016 -2018 2019
1-9 3,008.92 -146.87 356.39 224.63
2019 1-9 2017 2018

3

92.10%

92.08%

93.06%

93.20%



2019 9

2018

2017

2016

		1,002,659.55	481,670.39	351,449.45	214,844.11
		4.04	6.79	6.45	5.89
		335,926.89	321,110.15	276,547.18	223,036.00
		4.30	6.21	7.78	7.22
		-	331,948	339,763	262,293
		-	3.39	4.12	4.18

2019 9

2019 9

1

=0.2311

0.69% 0.56% 1.48% 0.84%

	246,895.20	1,951.65	0.79%	156,743.00	3,872.82	2.47%
	103,401.10	1,576.87	1.53%	98,122.13	946.63	0.96%
	128,322.80	658.33	0.51%	76,564.07	494.24	0.65%
	22,544.84	-	-	28,735.48	-	-
	151,225.08	983.79	0.65%	101,025.24	1,080.90	1.07%
	37,937.82	143.46	0.38%	27,309.58	67.62	0.25%
	84,278.68	552.40	0.66%	97,576.36	535.04	0.55%
	27,701.16	-	-	19,045.55	-	-

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1

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		140,785.31	117,187.34	112,065.16	112,085.69
		28.09%	32.54%	37.21%	45.76%
		731,039.55	993,119.79	1,036,966.38	655,661.61
		19.76	23.10	21.36	15.61
	/	3.70	4.30	4.86	4.20
		24.77%	25.84%	29.23%	30.65%
		19.86	23.17	21.57	15.73
		99.50%	99.70%	99.03%	99.24%
		204,701.65	105,046.56	70,773.88	41,199.92
		40.85%	29.17%	23.50%	16.82%
		945,943.20	681,272.42	546,160.01	478,163.73
		0.78	1.06	1.04	1.02
	/	120.57	64.26	52.58	46.89
		12.38%	12.61%	14.73%	15.06%
		0.85	1.12	1.07	1.00
		91.76%	94.64%	97.20%	102.00%
		80,404.21	66,350.91	49,611.89	53,495.19
		16.04%	18.42%	16.47%	21.84%
		667,507.89	662,695.34	927,126.38	738,755.32
		0.52	0.55	0.64	0.57
	/	128.72	121.25	143.76	129.6
		12.26%	14.84%	18.38%	19.89%
		0.52	0.55	0.66	0.54

		100.00%	100.00%	96.97%	105.56%
		52,727.92	42,844.37	40,990.66	19,130.39
		10.52%	11.90%	13.61%	7.81%
		22,544.84	28,735.48	27,701.16	19,045.55

4

5

2

1

99.09% 99.06%

97.74% 98.18%

99.73% 98.70% 98.76% 96.24%

1

	244,919.23	1,846.67	129.30	246,895.20
	102,437.27	963.83	-	103,401.10
	128,249.21	73.58	-	128,322.80
	16,421.49	5,903.07	220.28	22,544.84
	153,968.21	2,654.97	119.82	156,743.00
	97,480.75	641.32	0.06	98,122.13

	76,434.40	118.85	10.81	76,564.06
	24,138.11	4,204.14	393.23	28,735.48
	150,716.53	484.58	23.97	151,225.08
	37,866.43	71.40	-	37,937.82
	84,248.94	23.16	6.58	84,278.68
	25,491.92	1,965.46	243.79	27,701.16
	100,310.95	586.54	127.75	101,025.24
	27,260.85	48.00	0.74	27,309.58
	97,305.97	253.55	16.84	97,576.36
	17,851.22	1,050.54	143.79	19,045.55

2

	246,895.20	236,339.71	95.72%	156,743.00	153,079.62	97.66%
	103,401.10	101,741.94	98.40%	98,122.13	97,775.72	99.65%
	128,322.80	122,543.55	95.50%	76,564.06	76,449.19	99.85%
	151,225.08	148,450.29	98.17%	101,025.24	100,516.69	99.50%

	37,937.82	37,296.44	98.31%	27,309.58	27,238.18	99.74%
	84,278.68	84,149.02	99.85%	97,576.36	97,546.62	99.97%

$$\begin{aligned}
 & \frac{2016 \text{ 12 31}}{2017 \text{ 12 31}} = \frac{2016 \text{ 12 31}}{2017 \text{ 12 31}} \\
 & \frac{2018 \text{ 12 31}}{2019 \text{ 9 30}} = \frac{2018 \text{ 12 31}}{2019 \text{ 9 30}}
 \end{aligned}$$

3

	5.63%	4.08%	1.50%	2.18%
	4.26%			

1

2

3

4

2016-2018

5

2016-2018

2019

6

7

2

346,829.44

347,325.10 239,158.91 305,146.83

29.35% 26.22% 17.31% 17.97%

411,797.00 437,746.20 585,171.03 577,438.73

1

2

3

	37.21	33.77	52.7	59.62
	264,250.74	200,753.17	335,732.06	321,272.78
	40,858.88	38,371.97	11,540.34	25,497.04

2019 9 30

1		38,329.01	25,960.61	12,368.39	/

2		33,496.81	33,496.80	0.01	/
3		33,387.61	22,578.59	10,809.03	/
4		30,404.88	30,341.33	63.56	/
5		30,252.51	19,878.76	10,373.75	/
6		21,251.88	21,251.88	-	
7		19,005.71	17,999.76	1,005.95	/
8		10,193.91	10,193.91	-	
9		10,061.17	10,061.17	-	
10		9,129.48	9,129.48	-	
11		8,024.59	8,024.59	-	
12		7,640.25	3,693.51	3,946.74	/
13		7,058.77	7,058.77	-	
14		5,742.77	5,742.77	-	
15		3,877.50	3,750.93	126.58	/
16		3,275.93	3,275.93	-	
17		3,033.01	3,033.01	-	
18		2,331.06	2,331.06	-	
19		2,143.20	2,143.20	-	
20		1,905.24	1,905.24	-	
21		1,733.16	1,733.16	-	
22		1,454.90	1,454.90	0.00	/
23		1,382.26	1,382.26	-	
24		1,267.18	1,267.18	-	
25		1,262.09	23.95	1,238.14	/
26		1,232.65	1,232.65	-	
27		1,214.78	1,214.78	-	
28		1,138.64	1,138.64		
29		1,118.10	1,118.10	-	
30		1,037.99	1,037.99	-	
31		1,028.59	1,028.59	-	
32		788.68	788.68	-	

33	Danske Bank	782.51	782.51		
34		781.94	781.94	-	
35	MANG POSTATION Branch, Woori Bank	626.52	626.52	-	
36		616.98	616.98	-	
37		574.73	574.73	-	
38		565.3	100.76	464.53	/
39		550.77	539.62	11.15	/

		305,109.62	264,250.74	40,858.88	

2018 12 31

1		55,054.65	53,014.65	2,040.00	/
2		20,991.30	5,566.30	15,425.00	/
3		20,859.86	20,859.85	0.01	/
4		19,017.76	17,911.74	1,106.02	/
5		16,840.49	16,840.49	-	
6		16,415.73	15,554.56	861.17	/
7		14,524.47	14,524.47	-	
8		11,003.60	592.32	10,411.28	/
9		10,088.83	6,730.32	3,358.51	/
10		6,067.29	6,067.29	-	
11		5,674.90	5,674.90	-	
12		3,286.07	3,286.07	-	
13		3,062.66	3,062.66	-	
14		2,417.95	2,417.95	-	
15		2,257.78	2,257.78	-	
16		2,205.17	-	2,205.17	
17		2,089.61	2,089.61	-	
18		2,026.52	295.38	1,731.15	/
19		1,688.80	1,482.90	205.90	/
20		1,607.32	1,607.32	-	
21		1,427.81	1,427.81	-	
22		1,312.54	1,312.54	-	
23		1,263.34	1,263.34	-	
24		1,220.66	1,220.66	-	
25		1,125.95	1,125.95	-	

26		987.21	987.21	-	
27	Northern Trust Bank	958.91	958.91	-	
28		928.65	928.65	-	
29		843.93	843.93	-	
30		807.73	807.73	-	
31	Danske Bank	784.72	784.72	-	
32		772.66	772.66	-	
33		730.66	730.66	-	

57		112.74	112.74	-	
58		104.39	104.39	-	
59	The Bank of Yokohama, LTD. Sugita Branch	102.08	102.08	-	
60		96.82	96.82	0.00	/
61		96.35	96.35	-	
62		94.89	94.89	-	
63		91.26	91.26	-	
64		76.55	76.55	-	
65		75.70	75.70	-	
66	Chase Bank	72.16	72.16		
67		58.70	58.70	-	
68		40.49	40.49	-	
69		32.46	32.46	-	
70		21.74	21.74	-	
71	Bank, Credit Suisse	21.48	21.48		
72		20.29	20.29	-	
73		20.20	20.20	-	
74		19.70	19.70	-	
75	Deutsche Bank	12.86	12.86		
76		12.48	12.48	-	
77		10.84	10.84	-	
78		10.41	10.41	-	
79		7.78	7.78	-	
80		7.24	7.24	-	
81		6.69	6.69	-	
82		5.48	5.48	-	
83		5.23	5.23	-	
84		5.01	5.01	-	
85		4.42	4.42	-	
86		4.21	4.21	-	
87		2.06	2.06	-	

88		2.03	2.03	-	
89		1.00	1.00	-	
90		0.48	-	0.48	
91		0.27	0.27	-	
92		0.02	0.02	-	
93		0.00	0.00	-	

2017 12 31

1		69,374.55	69,252.82	121.73	/
2		65,119.27	63,109.27	2,010.00	/
3		41,706.52	39,647.79	2,058.73	/
4		41,152.84	40,306.94	845.90	/
5		27,636.22	27,594.95	41.28	/
6		20,540.65	19,884.02	656.63	/
7		15,821.87	15,821.87	-	
8		12,518.32	7,835.15	4,683.17	/
9		6,000.05	6,000.05	-	
10		5,143.43	5,143.43	-	
11		4,337.68	4,337.68	-	
12		3,957.44	3,957.44	-	
13		3,680.14	3,680.14	-	
14		3,476.95	3,476.95	-	
15		2,223.56	2,223.56	-	
16		2,029.11	2,029.11	-	
17		1,799.94	1,799.94	-	
18		1,626.72	1,624.94	1.78	/
19		1,322.74	1,322.74	-	
20		1,292.22	1,096.19	196.03	/

21		1,201.92	1,201.92	-	
22		1,176.23	714.16	462.07	/
23	Danske Bank	1,114.36	1,114.36	-	
24		991.14	991.14	-	
25		963.38	963.38	-	
26		944.70	944.70	-	
27		839.49	839.49	-	
28		792.36	792.36	-	
29		698.65	698.65	-	
30		698.03	698.03	-	
31		595.42	595.42	-	
32		552.60	552.60	-	
33		529.35	529.35	-	
34		453.65	2.61	451.04	/
35		427.70	427.70	-	
36		373.88	373.88	-	
37		365.62	365.62	-	
38		335.09	335.09	-	
39	The Bank of Yokohama, LTD. Sugita Branch	285.69	285.69	-	
40		276.86	276.86	-	
41	UFJ	255.93	255.93	-	
42		228.11	228.11	-	
43	MANG POSTATION BRANCH, Woori Bank	197.76	197.76	-	
44		183.53	183.53	-	
45		181.06	181.06	-	
46		176.29	176.29	-	
47		168.71	168.71	-	
48		136.65	136.65	-	
49		134.25	134.25	-	
50		129.56	129.56	-	

51		119.01	119.01	-	
52	Bank of America	107.15	107.15	-	
53		98.53	98.53	-	
54		91.25	91.25	-	
55		87.02	87.02	-	
56		79.77	67.78	11.99	/
57	Chase Bank	76.14	76.14	-	
58		64.00	64.00	-	
59		60.58	60.58	-	
60		40.51	40.51	-	
61		36.96	36.96	-	
62	Bank, Credit Suisse	36.12	36.12	-	
63		33.92	33.92	-	
64		32.37	32.37	-	
65		20.70	20.70	-	
66		19.21	19.21	-	
67		18.87	18.87	-	
68		12.96	12.96	-	
69	Northern trust bank	12.20	12.20	-	
70		9.82	9.82	-	
71		9.68	9.68	-	
72		7.79	7.79	-	
73		6.45	6.45		

2016 12 31

1		54,054.13	46,790.09	7,264.04	/
2		51,076.69	51,076.69	-	
3		48,625.47	48,161.24	464.23	/
4		34,404.01	34,266.95	137.06	/
5		29,346.25	29,346.25	-	
6		29,217.03	28,342.07	874.96	/
7		15,048.51	13,584.49	1,464.02	/
8		13,850.20	3,427.89	10,422.30	/
9		10,842.24	10,842.24	-	
10		7,505.19	7,505.19	-	
11		5,967.74	5,967.74	-	
12		5,080.93	5,080.93	-	
13		4,679.70	4,679.70	-	

30		878.06	878.06	-	
31		830.83	830.83	-	
32		773.93	773.93	-	
33		646.61	646.61	-	
34		599.25	599.25	-	
35		451.42	451.42	-	
36		275.52	275.52	-	
37		270.83	270.83	-	
38		226.56	226.56	-	
39		214.15	214.15	-	
40		207.75	207.75	-	
41	Bank of America	188.67	188.67	-	
42		183.87	183.87	-	
43		173.82	173.82	-	
44		147.44	147.44	-	
45	MANG POSTATION Branch, WooriBank	143.34	137.87	5.47	/
46		108.25	108.25	-	
47		87.55	87.55	-	
48		85.40	85.40	-	
49		68.72	68.72	-	
50		54.84	54.84	-	
51	Bank, Credit Suisse	52.18	52.18		
52		45.44	45.44	-	
53		41.48	41.48	-	
54		33.83	33.83	-	
55		30.25	-	30.25	
56		23.42	23.42	-	
57		20.48	20.48	-	
58		17.72	17.72	-	
59		14.38	14.38	-	

60		13.25	13.25	-	
61		7.66	7.66	-	
62		7.32	7.32	-	
63		7.21	7.21	-	
64		6.70	6.70	-	
65	Deutsche Bank	5.56	5.56	-	
66		5.45	5.45	-	
67		0.30	0.30	-	
68		0.22	0.22	-	
69		0.003	0.003	-	

1

2

3

25,497.04

11,540.34

38,371.97

40,858.88

7.35%

3.32%

16.04%

13.39%

	305,146.83	239,158.91	347,325.10	346,829.44
	40,858.88	38,371.97	11,540.34	25,497.04
	13.39%	16.04%	3.32%	7.35%

274,204.54 333,278.33 200,300.06 264,287.95

485,512.92 568,086.90 748,901.45 729,083.58

	305,146.83	239,158.91	347,325.10	346,829.44
	40,858.88	38,371.97	11,540.34	25,497.04
	-	486.88	2,506.43	47,127.86
	577,438.73	585,171.03	437,746.20	411,797.00
	127,940.42	103,088.07	30,766.33	41,585.26
	23,704.43	60,642.35	99,574.37	32,130.66

1

1,928,780.76

2,553,613.63 2,375,058.78 2,413,440.47

136,026.09 190,380.50 190,119.27 252,149.57

	200,377.12	141,126.26	145,155.35	100,725.78
	37,104.44	34,827.90	30,390.36	22,404.00
	3,702.60	4,060.20	4,969.36	4,266.55
	10,965.41	10,104.91	9,865.43	8,629.77

2018 2019 9
2016 2017
2017 2018

17.98%

13.60% 10.07% 12.64%

	14.09%	10.65%	17.56%	33.69%
	-	22.39%	19.10%	24.92%
	11.18%	6.96%	8.15%	7.18%
	19.11%	23.98%	24.31%	26.43%
	14.79%	16.00%	17.28%	23.06%
	12.64%	10.07%	13.60%	17.98%

2

1

2017 2018 2019 9 43.86%

48.93% 52.56% 2016

52.65% 2016

225,435.86 2017

2017

26.22% 17.31%

29.35%

	75.51%	79.88%	95.10%	76.14%

1

2016-2018

2

32016 -2018

4

5

1

1

2

2016 2017 2018

2019

9 30

3

4

5

6

2

3

2019 10 18 24
10 22 5%

2019 3 2019 9 30
30.51 57.74
1 2019 3

2
2017 10

2019 3

2019

+

5G

31.08

442.42%

10.73

2019

9 30

30.51

6.60

54.81

16.78

	2019 1-9	2018
	56.81	61.08
	86.16	102.18
	88.16	91.67
	54.81	71.59

=

+

-

		2019	10	10	2020	2	29
	4.04						
				2019	9	30	
57.74							

59,664,585

1.84%

32,451,000

1.00%

2019 12 13

2

360,000

0.01% 2019 11 20

2019 11 18

3

2019 12 30

1

	2017	10	17			
			20		3	
A			17	EB		117102
	2018	4	18	2020	10	14

5-10	21.00	/
------	-------	---

12	2019	10	18	2020	10	17
----	------	----	----	------	----	----

2

2018	4	18	2019	10	18	
					179,150.10	
89.58%			20,849.90			10.42%

3

4

		2018	4	11	2019	7	27	2019	8	23	2019
9	5	2019	11	12							

2019	10	22	10	31
------	----	----	----	----

[illegible]

1

2

3

1

1

2

2017

3

4

5

2

,

4

1

2

VR/AR

3

4

2	2018			3.21	
1		29.23%	25.84%	3.39	
			/		2018
	4.30	/	2017	4.86	/
				11.52%	
2		14.73%	12.61%	2.12	
2018			120,966.56		
3		18.38%	14.84%	3.54	
			50%		
	2018		2017	18.02%	
	13.65%				
3	2019	1-9		16.21%	2018
	2.65				
1					2018
17.76%	54.48%			8.30%	
		2019		2019	
	TWS		12%		
2					
2018	16.87%	38.11%			
			14.84%	12.26%	

2019				
	2019	2019	3,516,062.93	
2018	48.04%	163,350.23	2018	
62.35%	4.65%	2018	0.41	
	2019	2018		

1

2

3

4

1

		1	2	3 - 12
1		343,832.00	719,588.00	885,681.00
2		321,112.00	660,319.00	807,872.00
3		22,720.00	59,269.00	77,809.00
4		3,408.00	8,890.00	11,671.00
5		19,312.00	50,379.00	66,138.00

1

	1	2	3 - 12
	343,832.00	719,588.00	885,681.00
/	407	363	323
	909	2,085	2,860
	844	1,980	2,744
	92.85%	94.96%	95.94%

	2018	2019 1-9	T+1	T+2	T+3
/	596.66	638.27	407	363	323
	214.78	807.36	844	1,980	2,744
	97.62%	105.85%	92.87%	94.96%	95.96%

TWS

TWS

2

BOM

20 10

3

				3 - 12
		1	2	
1		343,832.00	719,588.00	885,681.00
2		321,112.00	660,319.00	807,872.00
3		24,068.10	42,371.30	51,997.60
4		297,043.90	617,947.70	755,874.40
5		13.61%	14.12%	14.66%

15.06% 14.73% 12.61%

12.38% 2018 TWS 2018 2019

2018 TWS 2019 1-9

8.30% 2019 TWS 12%

2 VR/AR

		1	2	3 - 12
1		96,000.00	378,000.00	560,000.00
2		91,155.00	357,156.81	511,518.42
3		4,845.00	20,843.19	48,481.59
4		727.00	3,126.48	7,272.24
5		4,118.00	17,716.71	41,209.35

1

	1	2	3 - 12
	96,000.00	378,000.00	560,000.00
/	1,500.00	1,575.00	1,600.00
	70.00	250.00	350.00
	64.00	240.00	350.00
	91.43%	96.00%	100.00%

VR/AR

VR/AR

3

2

BOM

30 10

3

		1	2	3 - 12
1		96,000.00	378,000.00	560,000.00
2		91,155.00	357,156.81	511,518.42
3		5,687.00	22,198.86	34,254.19
4		85,468.00	334,957.95	477,264.23
5		10.97%	11.39%	14.77%

VR/AR 2017 2018 2019 1-9 18.02%

13.65% 13.83% 2018 T+1 T+2

T+3 14.77%

	2017	2018	2019	1	

VR/AR

VR/AR

VR/AR

350

VR/AR

500

VR

VR/AR

VR/AR

VR

VR/AR

VR/AR

VR/AR

VR/AR

TWS		25%		TWS	
	AirPods		TWS		
			5.0	TWS	TWS
			Counterpoint Research		TWS
	2018	0.46	2020	1.29	
67.46%		2019-2025			
		TWS	2020	110.42	
2017-2020		76.7%			
TWS					
TWS					
TWS					
			TWS		
TWS					
TWS					TWS
TWS		TWS		AI	
AI				TWS	
		AI			
2					
2004			2009		
	15				
			3D		
		TWS			
TWS					

12%

TWS

1

1 /

VR

AR

VR

AR

Facebook

30

Oculus

2016

IDC

2017

VR/AR

836

29% 590

VR

					5G	
		VR/AR			VR/AR	
2019		VR/AR		27%	130	2018
2	/					
	/				/	
		/			5G	
		VR/AR				
VR/AR						
					VR/AR	
		VR/AR				
	IDC	Worldwide Quarterly Augmented and Virtual Reality Headset				
Tracker	2019	2023	VR/AR			
	66.7%	2023		6,860	AR	2023
	3,190	2019	2023		140.9%	VR 2023
	3,670	2019	2023		46.7%	
3						
	VR/AR				VR/AR	
		EE				
				2016	VR	
PSVR	Oculus			VR/AR		70%
				VR		30%
	VR			AR		2017
Kopin Corporation		10.10%				VR/AR

DOE+

FOV

Wave Optics Ltd

AR

VR/AR

VR/AR

VR/AR

2019 1-9	1,662,638.42	68.89%
2018	1,578,142.58	66.45%
2017	1,681,798.17	65.86%
2016	1,085,573.65	56.28%

2019 9

TWS

VR/AR

VR/AR

5G

VR/AR

VR/AR

VR/AR

350

3

5

DDP

2018 2019 1-9

1

2

3

4

5

FCA FOB DAP

6

2018 3 23

340

160

2,000

3,000

340

160

600

750

2019 12 15

USTR

			2,500		25		1,200
	9	1		3,000	A		
		15%	7.5%	12	15	3,000	B
			12	15			2019
12	15						
				2019	7	2019	12 15
12	01		750				

2019 1-9	1,931,781.43	708,328.06	/
2018	1,907,124.76	803,659.31	/

2019 1-9 1,931,781.43 2018

2019 1-9 708,328.06

2018

2018 79,862.74 2019 1-9

155,986.91 2018 2019 1-9

8.42% 2018 3,442.76 2019 1-9

30,588.94 2018 12.81% 2019 1-9

19.46%

TWS AR/VR

TWS AR/VR TWS

3,000 - A 2019 9 1 15%

2020 2 14 7.5% AR/VR 3,000 -

B 2019 12 15

TWS

1 TWS 3,000 - A 2019 9 1
15% 2020 2 14 7.5%

2

3 TWS FCA
TWS

4 TWS
TWS FCA

AR/VR

1 AR/VR 3,000 - B
2019 12 15

2 AR/VR FCA
3,000 - B

AR/VR

HTS

		2019
1-9	1,705,112.41	70.65%

2013

2019	1-9	24.77
------	-----	-------

			6.94%	6.64%	7.97%
4.96%,	2019	9	30		
	9,300		1,598		

2018	2019	1-9		
9,112.77	10,542.40		0.56%	0.60%
		2018	2019	1-9
		4,496.54		1,567.93
		0.28%	0.09%	

2018 2019 1-9

1		3,163.91	
2		2,886.72	
3		838.40	
4		647.04	
5		594.12	
			0.46%
1		2,446.27	
2		1,143.45	
3		1,049.97	
4		484.27	
5		441.68	
			0.34%

2018 2019 1-9

” “ ” “

” “1 ” “ ” “

” “ ” “1 ”

FCA FOB DAP

Knowles Corporation

“ ”

MEMS

1

MEMS

MEMS

2

3

MEMS

MEMS

5.84% 6.45% 6.74% 6.11%

1

2

2018 2019 1-9

3

4

5

6

57,484	97.32%	59,067
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90%

5%

1

2020

2016

2019

13.94%

17.72% 17.03% 16.23% 2019

2

3

2020 1

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