MAIN MENU

WEPD – Type I [68, 34, 12]

This is a database of known weight enumerator parameters for singly-even binary self-dual $[68, 34, 12]$ codes.

The possible weight enumerators of a singly-even binary self-dual $[68, 34, 12]$ code are given in [2] as

$$W_{68,1} = 1 + (442 + 4\alpha)x^{12} + (10864 - 8\alpha)x^{12} + \cdots,$$
$$W_{68,2} = 1 + (442 + 4\alpha)x^{12} + (14960 - 8\alpha - 256\beta)x^{12} + \cdots,$$

where $\alpha, \beta \in \mathbb{Z}$.

See the links below for lists of known values of (α, β) for $W_{68,1}$ and $W_{68,2}$.

- $W_{68,1}$ known parameters (from [4, 5, 20, 23, 24, 26, 30, 31, 38–41])
- $W_{68,2}$ known parameters (from [1–23, 25–37, 39–41])

References

[1] M. Bortos, J. Gildea, A. Kaya, A. Korban, and A. Tylyshchak. New self-dual codes of length 68 from a 2×2 block matrix construction and group rings. *Adv. Math. Commun.*, 16(2):269–284, 2022. doi: 10.3934/amc.2020111.

[2] S. Buyuklieva and I. Boukliev. Extremal self-dual codes with an automorphism of order 2. *IEEE Trans. Inform. Theory*, 44(1):323–328, 1998. doi: 10.1109/18.651059.

[3] J. H. Conway and N. J. A. Sloane. A new upper bound on the minimal distance of self-dual codes. *IEEE Trans. Inform. Theory*, 36(6):1319–1333, 1990. doi: 10.1109/18.59931.

[4] S. T. Dougherty and M. Harada. New extremal self-dual codes of length 68. *IEEE Trans. Inform. Theory*, 45(6):2133–2136, 1999. doi: 10.1109/18.782158.

[5] S. T. Dougherty, J. Gildea, A. Korban, A. Kaya, A. Tylyshchak, and B. Yildiz. Bordered constructions of self-dual codes from group rings and new extremal binary self-dual codes. *Finite Fields Appl.*, 57:108–127, 2019. doi: 10.1016/j.ffa.2019.02.004.

[6] S. T. Dougherty, J. Gildea, and A. Kaya. Quadruple bordered constructions of self-dual codes from group rings. *Cryptogr. Commun.*, 12(1):127–146, 2020. doi: 10.1007/s12095-019-00380-8.

[7] S. T. Dougherty, J. Gildea, and A. Kaya. 2^n bordered constructions of self-dual codes from group rings. *Finite Fields Appl.*, 67, 2020. doi: 10.1016/j.ffa.2020.101692.

[8] S. T. Dougherty, J. Gildea, A. Kaya, and B. Yildiz. New self-dual and formally self-dual codes from group ring constructions. *Adv. Math. Commun.*, 14(1):11–22, 2020. doi: 10.3934/amc.2020002.

[9] S. T. Dougherty, J. Gildea, A. Korban, and A. Kaya. Composite constructions of self-dual codes from group rings and new extremal self-dual binary codes of length 68. *Adv. Math. Commun.*, 14(4):677–702, 2020. doi: 10.3934/amc.2020037.

[10] S. T. Dougherty, J. Gildea, A. Korban, and A. Kaya. New extremal self-dual binary codes of length 68 via composite construction, $\mathbb{F}_2 + u\mathbb{F}_2$ lifts, extensions and neighbours. *Int. J. Inf. Coding Theory*, 5(3–4): 211–226, 2020. doi: 10.1504/IJICOT.2020.110703.

[11] S. T. Dougherty, J. Gildea, A. Korban, and A. Kaya. Composite matrices from group rings, composite G-codes and constructions of self-dual codes. *Des. Codes Cryptogr.*, 89(7):1615–1638, 2021. doi: 10.1007/s10623-021-00882-8.

[12] J. Gildea, A. Kaya, R. Taylor, and B. Yildiz. Constructions for self-dual codes induced from group rings. *Finite Fields Appl.*, 51:71–92, 2018. doi: 10.1016/j.ffa.2018.01.002.

[13] J. Gildea, A. Kaya, A. Tylyshchak, and B. Yildiz. A group induced four-circulant construction for self-dual codes and new extremal binary self-dual codes, 2019. arXiv:1912.11758.

[14] J. Gildea, A. Kaya, and B. Yildiz. An altered four circulant construction for self-dual codes from group rings and new extremal binary self-dual codes I. *Discrete Math.*, 342(12), 2019. doi: 10.1016/j.disc.2019.111620.

[15] J. Gildea, H. Hamilton, A. Kaya, and B. Yildiz. Modified quadratic residue constructions and new extremal binary self-dual codes of lengths 64, 66 and 68. *Inform. Process. Lett.*, 157, 2020. doi: 10.1016/j.ipl.2020.105927.

[16] J. Gildea, A. Kaya, A. Korban, and A. Tylyshchak. Self-dual codes using bisymmetric matrices and group rings. *Discrete Math.*, 343(11), 2020. doi: 10.1016/j.disc.2020.112085.

[17] J. Gildea, A. Kaya, A. Korban, and B. Yildiz. New extremal binary self-dual codes of length 68 from generalized neighbors. *Finite Fields Appl.*, 67, 2020. doi: 10.1016/j.ffa.2020.101727.

[18] J. Gildea, A. Kaya, and B. Yildiz. New binary self-dual codes via a variation of the four-circulant construction. *Math. Commun.*, 25(2):213–226, 2020.

[19] J. Gildea, R. Taylor, A. Kaya, and A. Tylyshchak. Double bordered constructions of self-dual codes from group rings over Frobenius rings. *Cryptogr. Commun.*, 12(4):769–784, 2020. doi: 10.1007/s12095-019-00420-3.

[20] J. Gildea, A. Kaya, A. M. Roberts, R. Taylor, and A. Tylyshchak. New self-dual codes from 2×2 block circulant matrices, group rings and neighbours of neighbours. *Adv. Math. Commun.*, 2021. doi: 10.3934/amc.2021039.

[21] J. Gildea, A. Kaya, R. Taylor, A. Tylyshchak, and B. Yildiz. New extremal binary self-dual codes from block circulant matrices and block quadratic residue circulant matrices. *Discrete Math.*, 344(11), 2021. doi: 10.1016/j.disc.2021.112590.

[22] J. Gildea, A. Korban, A. Kaya, and B. Yildiz. Constructing self-dual codes from group rings and reverse circulant matrices. *Adv. Math. Commun.*, 15(3):471–485, 2021. doi: 10.3934/amc.2020077.

[23] J. Gildea, A. Korban, A. M. Roberts, and A. Tylyshchak. Binary self-dual codes of various lengths with new weight enumerators from a modified bordered construction and neighbours. *Adv. Math. Commun.*, 2022. doi: 10.3934/amc.2022021.

[24] J. Gildea, A. Korban, and A. M. Roberts. The weight enumerators of singly-even self-dual $[88, 44, 14]$ codes and new binary self-dual $[68, 34, 12]$ and $[88, 44, 14]$ codes, 2023. (in submission).

[25] M. Gürel and N. Yankov. Self-dual codes with an automorphism of order 17. *Math. Commun.*, 21(1): 97–107, 2016.

[26] T. A. Gulliver and M. Harada. Classification of extremal double circulant self-dual codes of lengths 64 to 72. *Des. Codes Cryptogr.*, 13(3):257–269, 1998. doi: 10.1023/A:1008249924142.

[27] M. Harada and T. Nishimura. An extremal singly even self-dual code of length 88. *Adv. Math. Commun.*, 1(2):261–267, 2007. doi: 10.3934/amc.2007.1.261.

[28] S. Karadeniz and B. Yildiz. New extremal binary self-dual codes of length 68 from R_2-lifts of binary self-dual codes. *Adv. Math. Commun.*, 7(2):219–229, 2013. doi: 10.3934/amc.2013.7.219.

[29] A. Kaya. New extremal binary self-dual codes of length 68 via the short Kharaghani array over $\mathbb{F}_2 + u\mathbb{F}_2$. *Math. Commun.*, 22(1):121–131, 2017.

[30] A. Kaya and N. Tüfekçi. New extremal binary self-dual codes of lengths 66 and 68 from codes over $R_{k,m}$. *Bull. Korean Math. Soc.*, 54(1):29–42, 2017. doi: 10.4134/BKMS.b150213.

[31] A. Kaya and B. Yildiz. New extremal binary self-dual codes of length 68. *J. Algebra Comb. Discrete Struct. Appl.*, 1(1):29–39, 2014. doi: 10.13069/jacodesmath.79879.

[32] A. Kaya and B. Yildiz. Various constructions for self-dual codes over rings and new binary self-dual codes. *Discrete Math.*, 339(2):460–469, 2016. doi: 10.1016/j.disc.2015.09.010.

[33] A. Kaya and B. Yildiz. New extremal binary self-dual codes from a Baumert-Hall array. *Discrete Appl. Math.*, 271:74–83, 2019. doi: 10.1016/j.dam.2019.08.003.

[34] A. Kaya, B. Yildiz, and I. Siap. New extremal binary self-dual codes of length 68 from quadratic residue codes over $\mathbb{F}_2 + u\mathbb{F}_2 + u^2\mathbb{F}_2$. *Finite Fields Appl.*, 29:160–177, 2014. doi: 10.1016/j.ffa.2014.04.009.

[35] A. Kaya, B. Yildiz, and I. Siap. New extremal binary self-dual codes from $\mathbb{F}_4 + u\mathbb{F}_4$-lifts of quadratic circulant codes over $\mathbb{F}_4$. *Finite Fields Appl.*, 35:318–329, 2015. doi: 10.1016/j.ffa.2015.05.004.

[36] A. Kaya, B. Yildiz, and A. Pasa. New extremal binary self-dual codes from a modified four circulant construction. *Discrete Math.*, 339(3):1086–1094, 2016. doi: 10.1016/j.disc.2015.10.041.

[37] A. M. Roberts. Self-dual codes from a block matrix construction characterised by group rings, 2023. (in submission).

[38] H.-P. Tsai. Extremal self-dual codes of lengths 66 and 68. *IEEE Trans. Inform. Theory*, 45(6):2129–2133, 1999. doi: 10.1109/18.782156.

[39] H.-P. Tsai, P.-Y. Shih, R.-Y. Wu, W.-K. Su, and C.-H. Chen. Construction of self-dual codes. *IEEE Trans. Inform. Theory*, 54(8):3826–3831, 2008. doi: 10.1109/TIT.2008.926454.

[40] N. Yankov, M. H. Lee, M. Gürel, and M. Ivanova. Self-dual codes with an automorphism of order 11. *IEEE Trans. Inform. Theory*, 61(3):1188–1193, 2015. doi: 10.1109/TIT.2015.2396915.

[41] N. Yankov, M. Ivanova, and M. H. Lee. Self-dual codes with an automorphism of order 7 and s-extremal codes of length 68. *Finite Fields Appl.*, 51:17–30, 2018. doi: 10.1016/j.ffa.2017.12.001.