Yamada, Mieko
Hadamard matrices of generalized quaternion type. (English) ｜Zbl 0725.05028｜
Discrete Math. 87, No. 2, 187-196 (1991).

The work is devoted to the problem of Hadamard matrix (H.M.) construction using the group-theoretical approach. H.M. is determined as a right regular representation of matrix of an element in R, which is obtained from the group ring ZG, where G is a semi-direct product of a cyclic group of an odd order by a generalized quaternion group Q_s. In particular, if $s = 1$, the considered H.M. are H.M. of type Q, and adding the condition that the submatrices of H.M. of type Q are symmetric, they become H.M. of Williamson type.

In the paper the existence of some infinite series of H.M. of generalized quaternion type using the theory of the relative Gauss sum, is given.

Reviewer: S.S.Agayan (Erevan)

MSC:

05B20   Combinatorial aspects of matrices (incidence, Hadamard, etc.)

Cited in **1** Review
Cited in **4** Documents

Keywords:

Hadamard matrix; Williamson type

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References:

[1]   Delsarte, P.; Goethals, J.M.; Seidel, J.J., Orthogonal matrices with zero diagonal II, Canad. J. math., 23, 816-832, (1971) · Zbl 0209.03703

[2]   Ito, N., Note on Hadamard matrices of type \textit{Q}, Studia scientiarum mathematicarum hungarica, 16, 389-393, (1981) · Zbl 0537.05012

[3]   Lang, S., Cyclotomic fields, (1978), Springer Berlin · Zbl 0395.12005

[4]   Turyn, R.J., An infinite class of williamson matrices, J. combin. theory ser. A, 12, 319-321, (1972) · Zbl 0237.05008

[5]   Wallis, W.D.; Street, A.P.; Wallis, J.S., Combinatorics: room squares, sum-free sets, Hadamard matrices, Lecture notes in math., 292, (1972), Springer Berlin · Zbl 1317.05003

[6]   Williamson, J., Hadamard's determinant theorem and sum of four squares, Duke math. J., 11, 65-81, (1944) · Zbl 0060.03202

[7]   Yamamoto, K., On a generalized williamson equation, Colloquia Mathematica societatis janos bolyai, 37, 839-850, (1985)

[8]   Yamamoto, K.; Yamamda, M., Williamson Hadamard matrices and Gauss sums, J. math. soc., 37, 703-717, (1985), Japan · Zbl 0584.05016

[9]   Ito, N.; Leon, J.S.; Longyear, J.Q., Classification of 3-(24, 12, 15) designs and 24-dimensional Hadamard matrices, J. combin. theory ser. A, 31, 66-93, (1981) · Zbl 0477.05019

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