

SECTION 678-4

SOLID STATE FLASHER (MODEL 204)

678-4.1 General Requirements:

- (a) A Solid State Flasher herein referred to as a Flasher, is used to periodically interrupt a source of alternating current line power for the purpose of providing flashing traffic signals. For the purpose of these specifications; the term solid state shall be construed to mean that the main current to the signal load is not switched by electro-mechanical contacts.
- (b) The Flasher to be provided for each cabinet assembly shall be Model 204. The double circuit flasher shall have a minimum current rating per circuit of 15 amperes for a Tungsten-1amp load. The major street flashing indications shall be connected to one (1) load circuit of the Flasher and the minor street flashing indications shall be connected to the other load circuit of the Flasher.

678-4.2 Design Requirements:

678-4.2.1 Physical Characteristics:

Figure 678-7 illustrates the physical attributes of the Model 204 Solid State Flasher.

- (a) Overall dimensions of the Flasher shall not exceed 8.25 inches from the panel surface holding the mating connector, including any handle or gripping device. The Flasher shall be no more than 1.9 inches in width and no more than 4.2 inches high.
- (b) The Flasher shall inter-mate with a BEAU S-5406 socket or approved equivalent.
- (c) The Plug Connector shall be a BEAU P-5406-LAB or approved equivalent.
- (d) The lower surface of the Flasher shall be no more than 2.1 inches below the centerline of the connector configuration.
- (e) The Flasher shall be constructed so no part of it will extend more than 0.9 inches to the left and 1.1 inches to the right of the centerline of the connector pin configuration as viewed from the front.
- (f) Continuous edge guides shall be provided on the Flasher.
- (g) Flasher control circuitry and switches shall be readily accessible by the use of a screwdriver or wrench. Only one (1) type of screw head end (slotted or phillips) shall be used throughout.
- (h) Each Flasher shall be so constructed that persons inserting or removing the module will not be exposed to any parts having live voltage. A handle shall be attached to

the front of each Flasher to facilitate the Flasher insertion or removal from its mating connector.

- (i) The front panel of the Flasher shall be provided with one (1) indicator per circuit. The indicators shall be vertically centered on the front panel with top and bottom indicators no more than 1-inch from the panel vertical center.
- (j) The indicators shall indicate the output state of the Flasher.
- (k) All printed circuit boards shall be made from NEMA (FA-4) gloss-epoxy, or equivalent (see NEMA Standards Publication for Industrial Laminated Thermosetting Products, Publication No. LI 1-1971), or latest revision thereof).
- (l) Circuit boards exceeding 2-inches in any dimension shall have a nominal thickness of at least 1/16-inch. Circuit boards not exceeding 2-inches in any dimensions shall have a nominal thickness of at least 1/32-inch.
- (m) The walls of all plated through holes shall have a minimum copper plating thickness of 0.001 inch. All circuit tracks shall have a conductivity equivalent to at least 2 ounces per square foot of copper. All electrical mating surfaces shall be made of noncorrosive material.
- (n) Each components of the flasher shall be identified by a circuit reference symbol. This identification may be affixed to the printed circuit board(s), the cover of the unit, or in the assembly drawing provided with the unit.

678-4.2.2 Electrical Characteristics:

- (a) Rating of the output circuit shall be the minimum rating for a tungsten lamp or gas tubing transformer load over a voltage range of 60 to 135 volts at 60 hertz and shall not be de-rated for operation over the temperature and humidity range specified in Section 672.
- (b) Input to the Flasher shall consist solely of the 60 hertz altering current power source. This input shall supply the power for the output circuit and also provide power to the flasher logic. The Flasher shall "turn on " within 5 degrees of the zero voltage point of the alternating current line sinusoid and shall "turn off" within 5 degrees of the zero current point of the alternating current line sinusoid. The Flasher need not "turn on" within 5 degrees of the zero point of the alternating current sinusoid for the first flash cycle (on-off cycle) after the initial application of alternating current power to the Flasher.
- (c) The "flashing" voltage output shall provide not less than 50 nor more than 60 flashes per minute with an on period of 50 ± 5 percent.
- (d) The Flasher output shall have a dv/dt rating of 200 volts per microsecond at 70°F (21.11°C).
- (e) The Flasher output shall have a peak standoff voltage of 480 volts or greater at 70°F (21.11°C).

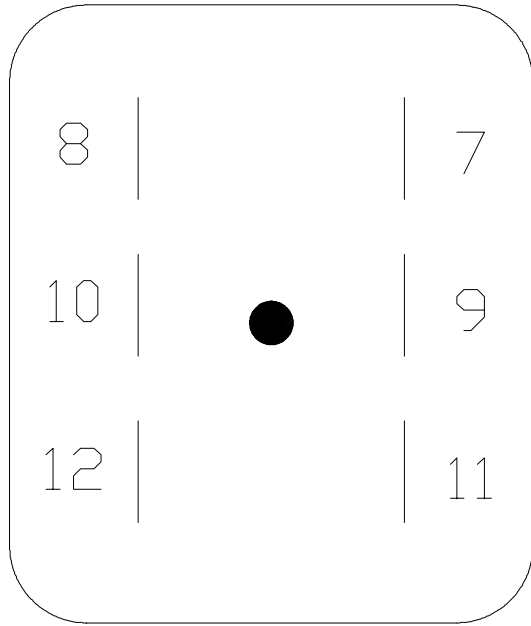
- (f) The output current from the Flasher through the load when the Flasher is in the off state shall not exceed a maximum of 15 milliamperes RMS.
- (g) Flasher shall have circuit 1 ON when circuit 2 is OFF and vice versa. The maximum off period when both circuits are off, or the maximum on period when both circuits are on shall not exceed 17 milliseconds during the transition from OFF to ON and ON to OFF.

(h) A surge arrestor shall be provided between AC+ (pin 11) and Flasher Out (pins 7 & 8). The surge arrestor shall be capable of reducing the effects of a transient voltage applied to the field signal circuits, and shall have the ratings as shown below:

Recurrent peak voltage:	212 Volts
Energy rating, maximum:	50 Joules
Power dissipation, average:	0.85 Watt
Peak current for pulses less than 6 us:	2000 Amperes
Standby current:	Less than 1 ma

678-4.3 Pin Assignments:

Figure 678-9 illustrates the pin assignments for the Solid State Flashers.



PIN NUMBER

FUNCTION

7	Load Circuit 1
8	Load Circuit 1
9	Chassis Ground
10	AC (-) Common
11	AC (+) Hot
12	No Connection

Figure 678-9: MODEL 204 FLASHER PIN ASSIGNMENTS