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Morse (J2A) duty cycle ratings for Codan transceivers

1 Definitions

Duty cycle is defined as the ratio of transmit to transmit + receive time.

Transmit is assumed to have a maximum of 50% key-down time.

Transmit time is the maximum length of the sending session before listening. Receive time is the minimum listening time after transmitting for the maximum transmit time before transmitting again.

2 Maximum Recommended Duty Cycles

2.1 8525B/8528 with option F and 8540B PSU

100% duty cycle up to 50°C ambient

2.2 8525B/8528 with output transformer heatsink (part of option F) and 8540B PSU

100% duty cycle up to 30°C			
75% duty cycle up to 40°C	20 min Tx	7 min Rx	See [A] below
50% duty cycle up to 50°C	7 min Tx	7 min Rx	See [A] below

2.3 8525B/8528 and 8540B PSU

90% duty cycle up to 30°C	15 min Tx	2 min Rx	See [B] below
75% duty cycle up to 40°C	15 min Tx	5 min Rx	See [A] below
50% duty cycle up to 50°C	7 min Tx	7 min Rx	See [A] below

2.4 X-2 and 9113 PSU

50% duty cycle up to 30°C	10 min Tx	10 min Rx	See [C] below
50% duty cycle up to 40°C	5 min Tx	5 min Rx	See [C] below
30% duty cycle up to 50°C	3 min Tx	7 min Rx	See [C] below

Factors limiting duty cycle are:

[A] PA heatsink limited to 70°C
[B] Output transformer limited to 90°C
[C] PA heatsink limited to 60°C (internal temp 70°C)
PSU heatsink limited to 60°C
PSU mains transformer thermal limit (1 - 2 hours)

Allowance has been made for likely load VSWR's but the worst case has not necessarily been covered.

3 Protection Circuits

All Codan transceivers incorporate thermal protection of the output transistors which limits their mounting block temperatures to approximately 90°C. Above this temperature the power output is reduced to maintain this temperature.

The 9113 PSU incorporates thermal protection of both heatsink and mains transformer. In the event of thermal overload, the output voltage is reduced which may increase the pass transistor dissipation and result in slow thermal oscillations. This is more likely to happen with mains voltages above 250V and unlikley to happen with the maximum recommended duty cycles.

4. Mounting Arrangements

8525B/8528 may be mounted in module clamps with the 8540B below the transceiver. Free air circulation must be allowed.

If the equipment is rack mounted, adequate rack ventilation must be provided.

X-2 and 9113 must be separated by at least 100mm sideways. Allowing the heatsink fins to project over the back of a table which will improve cooling.

5. Long-term Reliability

The long-term reliability is a function of operating temperature. Any factors which reduce the temperature, such as cooling draughts, shading from direct sunlight etc., will be beneficial.