Duty Cycle Correction Factor

FCC ID:2AB6OTX3B25A

Transmit Power Duty Cycle

IEEE 802.15.4. 2.4GHz PHY

Data Rate	250 kbps
	31.25 kbytes/sec
Symbols/byte	2 sym/byte
Symbol Timing	62.5 sym/sec
	0.000016 sec/sym
Byte Timing	0.000032 sec/byte
PHY PSDU	6 bytes
Max length	127 bytes
Total Packet Length	133 bytes
Max time TX PKT	0.004256 sec

Long Frame Scenario

1) TX Frame — Assume Frame is Data Frame
2) Wait for ACK
3) Wait for LIFS
4) Repeat

Long InterFrame Spacing Slotted w/ACK		
Long Frame	127	bytes
Data Frame Payload	102	Bytes
ACK Frame	5	Bytes
Tack	12	Sym
LIFS	40	Sym
ACK Frame	11	Bytes
Backoff Period	20	Sym
Max Backoff	7	Random
Backoff Required	2	
Backoff Time	60	Sym

Transmit Time	
TX Time Packet	0.004256
TX Time ACK	0.000352
Total TX Time	0.004608

Off Time	
Backoff Time	0.00192
Tack minimum	0.000192
LIFS	0.00064
Total Off Time	0.002752

Duty Cycle (On Total) 62.61% Represents MAC only performance

Network Based Calculation

Long InterFrame Spacing Slotted w/ACK		
Long Frame	127	bytes
Data Frame Payload	102	Bytes
ACK Frame	5	Bytes
Tack	12	Sym
LIFS	625	Sym
ACK Frame	11	Bytes
Backoff Period	20	Sym
Max Backoff	7	Random
Backoff Required	2	
Backoff Time	60	Sym

Single hop data indicates 10 msec interpacket spacing

Transmit Time	
TX Time Packet	0.004256
TX Time ACK	0.000352
Total TX Time	0.004608

Off Time	
Backoff Time	0.00192
Tack minimum	0.000192
LIFS	0.01
Total Off Time	0.012112

Duty Cycle (On Total) 27.56% Calculated Network performance

Alternative calculation
Max radio throughput 250 kbps
Measured throughput single hop 66.816 kbps

Duty Cycle 26.73%

FCC Calculation 27%

DCF = 20 * log (.27) = -11.34dB