

SoftDevice processing activity in the different priority levels during use of Radio Timeslot API is outlined in the table below.

Table 17-3. Processor usage for the Radio Timeslot API

Parameter	Description	Min	Typical	Max
$t_{ISR(0),RadioTimeslotPrepare}$	Interrupt processing when starting up the high frequency crystal.			9 μ s
$t_{ISR(0),RadioTimeslotActivity}$	The application processing timeslot. The length of this is application dependent.			
$t_{ISR(4)}$	Priority level 4 interrupt at the end of the timeslot.		7 μ s	

17.3.3 ANT processor usage patterns

17.3.3.1 ANT processor priorities

The breakdown for a single ANT transmit or receive protocol event is shown in Figure 17-5.

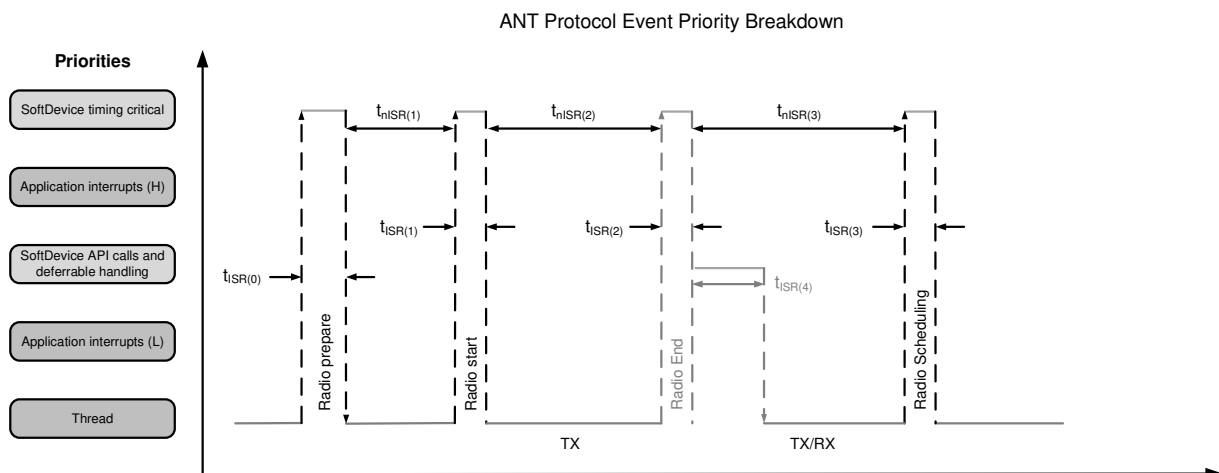


Figure 17-5. ANT Protocol Event

If required, Application interrupts (H) may be used. However, the interrupt should not exceed 100 μ s per 500 μ s interval or ANT performance will be adversely affected. If high application interrupts are not needed, all application processes should be run at Application interrupts (L) and/or at Thread level.

To improve RF transmit integrity, system power changes are prevented during radio transmissions (Radio start to Radio end). Applications issuing the SoftDevice wait for event API call will not result in the CPU entering idle/sleep mode until the transmission activity has completed.

ANT radio and stack processing times for all supported ANT activity types in typical use cases (without high application priority interruption) are summarized in Table 17-4. High priority application interrupts will directly affect ANT stack processing overhead time ($t_{ISR(4)}$).

Table 17-4. Processor usage latency when connected (ANT)

Parameter	Description	Min	Typical	Max
$t_{ISR(0)}$	Radio prepare time			58us
$t_{ISR(1)}$	Start of radio activity		12us	
$t_{ISR(2)}$	End of radio activity			19us
$t_{ISR(3)}$	Scheduling next radio session		37us	
$t_{ISR(4)}$	ANT stack processing time			168us
$t_{nISR(1)}$	Idle time between prepare and start	117us		
$t_{nISR(2)}$	Idle time during radio on	173us		
$t_{nISR(3)}$	Idle time between radio end and radio schedule	129us		

17.3.3.2 ANT processor availability

This section shows the processor availability for an application with different configurations of ANT traffic. This availability is measured as idle time, i.e. the time that the SoftDevice is not using the CPU. The data collected in Table 17-5 shows the amount of idle time for different types of ANT traffic. There are average and worst cases for the idle times.

The average case covers the time that traffic is occurring and the idle time between traffic. For example, a 4Hz broadcast channel would have a 99% average idle time, this would include the time that the traffic is occurring and the ~250ms idle time between the channels.

The worst case covers only the idle time when traffic is occurring. For example you can expect the CPU availability to dip to 86% on a 4Hz broadcast master channel for the short duration when ANT traffic is occurring (~4-5ms per traffic window for this type of traffic).

Table 17-5. Processor idle time for ANT traffic

Type of ANT Traffic	Average Idle Time	Worst Case Idle Time
Background Search / Channel Search	98%	95%
Continuous Scan	97%	97%
High Duty Search	95%	51%
4Hz Broadcast (Master)	99%	85%
4Hz Broadcast (Slave)	99%	92%
4Hz Acknowledged in Both Directions (Master)	95%	78%
4Hz Acknowledged in Both Directions (Slave)	95%	77%
Standard Burst (Master)	90%	78%
Standard Burst (Slave)	90%	78%