

### **Description of Operation**

The alarm and remote keyless entry module (ARKEM) is a body control module which is responsible for performing vehicle security, door lock / unlock functions. The ARKEM incorporates a 315 MHz receiver for remote keyless entry. The ARKEM has six discrete inputs for monitoring vehicle switch states and two analog inputs for monitoring key cylinder and interior door switch functions. The module has two solid state outputs (horn and status LED) and six relay outputs (door motors, park lamp and head lamp). The ARKEM also is configured and communicates status information over the vehicle's J1850 communications bus. All processing is performed by a Motorola MC68HC908AS32 mask ROM microcontroller running at 8.0127 MHz. The ARKEM supply voltage is 12 VDC.

Vehicle security is performed by monitoring the states of door, hood and trunk switches, key cylinder switches and the state of the ignition switch. The alarm is armed when the module upon a lock command after all vehicle doors are closed and ignition in the OFF position. The alarm is disarmed when the doors are unlocked with the mechanical key or via the key fob. The alarm is triggered when any door is opened with the alarm system in the armed state. When the alarm is triggered, the horn is pulsed and the park lamps and head lamps are alternately illuminated.

The receiver section is a 315 MHz Amplitude Shift Keying (ASK) superheterodyne receiver based on the Infineon TDA 5201 receiver chip. The chip incorporates on-board low noise amplifier (LNA), synthesized local oscillator, mixer, limiter and data slicer. The local oscillator frequency is 304.300 MHz (nominal) derived from a 6.128 MHz reference oscillator crystal. The total crystal frequency tolerance is  $\pm 150$ ppm.

To reduce stand-by current, the receiver is awakened by the micro every 30ms with a duty cycle of 33%. When awake, the micro reads the RF data to determine the presence of a valid RF transmission. If data pulses with valid pulse widths are detected, the receiver remains awake and the micro processes the received data stream. If the data packet information (vehicle access code) matches information stored in EEPROM (i.e. a programmed transmitter), the micro performs the command contained in the transmission (lock, unlock, panic, etc.).