RESULTS & DISCUSSION: An electrothermal SPICE-based model is shown that accurately models temperature rise due to applied RF power in ULM PIN diodes for MR scanners. The model is applied to a 1.5 T anti-parallel pair receive coil protection circuit and shows that, depending on the diode temperature coefficient, blocking can increase or decrease with increasing device temperature. Short MR pulses allow the diode to cool between pulses but high duty cycle MR pulses; this impact on diode heating and duty cycle is another variable that pulse sequence designers should include in duty cycle optimization. An Excel spreadsheet that calculates the SPICE subcircuit model is based on electrical and physical parameters is available at SourceForge.net (Public Domain License): http://sourceforge.net/projects/pindiodemodel/files/