

# TriMag™

## Triple Track MagStripe Decoding ASIC

### Triple Track Decoding in a Single, Small Footprint

TriMag provides three identical MagStripe decode channels in a footprint that is less than 6.5mm square. Decoding operations are fully contained with no external decoding components required. The decoded track data is buffered in internal RAM. MagStripe signals from 3mVpp to 1Vpp are read using a fast, adaptive AGC that compensates for real-world cards with magnetic or mechanical stripe damage. F2F data rates equivalent to media speeds from three to one hundred inches per second are easily decoded. The powerful decoding algorithms compensate for typical problems like dropout, skew, low amplitude, jitter, stripe noise, and bias. TriMag has two selectable application data interfaces.

### MSRD Interface Mode

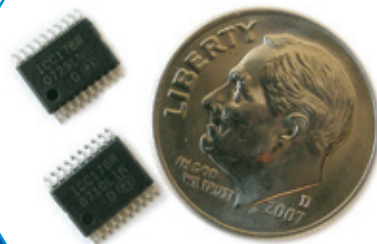
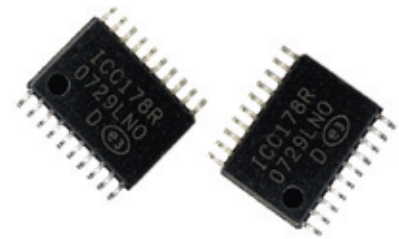
There are Data and corresponding Clock outputs for each magnetic stripe track input. There is a single Media Detect output common to the three decoding circuits. There are two selectable clock speeds. Clock duration can be at the same rate as card data rate or half of the card data rate.

### SPI Interface Mode

The serial output is a common SPI, slave node. The SPI receives commands from the application and sends buffered magnetic stripe data using a simple command set. MagStripe data can be sent by individual track or three tracks as one string. The internal RAM status is determined through status request commands.

### Features and Benefits:

- Designed for decoding "real-world" cards
- State-of-the-art 0.18 micron mixed signal, application specific IC (ASIC)
- Two card data output options are included, SPI or individual Clock & Data
- Compact, standard IC package, TSSOP-20 pin
- Simultaneously decodes and buffers three magnetic tracks
- Easily decodes cards from 30% to 200% of the standard amplitude
- Reads data from card swipe speeds from 3 to 100 IPS
- Supports two power supply voltages 2.73 to 3.6V or 4.5 to 5.5V
- Operating temperature range from -40°C to +85°C
- Low power sleep mode current < 60µA with 3V supply
- Low power operation during read decoding < 3mA
- Card Present or SPI Status Byte for indication for MagStripe data
- Automated internal head compensation to support most head types
- Automatic Gain Control for magnetic signal range from 3mV to 1V
- Simple to integrate & cost effective decoding solution
- High immunity to ambient noise and electrostatic discharge
- TriMag is a RoHS compliant component



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# TriMag™ Specifications IDTI78

## Absolute Maximum Ratings

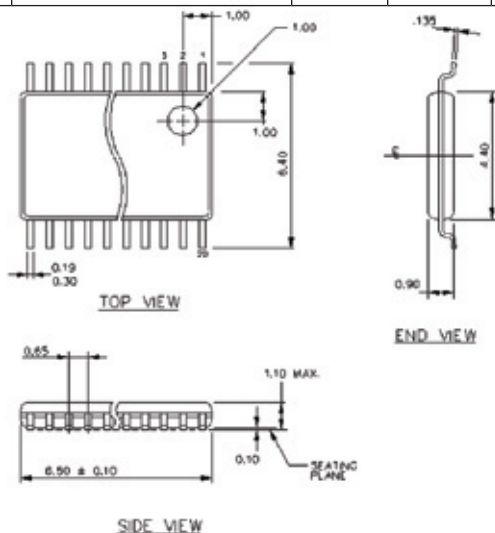
Symbol	Parameter	Min	Max	Units
Vdd_5V	5V DC Supply Voltage	-0.3	6	V
Vdd_3V	3.3V DC Supply Voltage	-0.3	3.7	V
Vin_5V	Input Pin Voltage, 5V mode	VSS-0.3	VDD_5+0.3	V
Vin_3V	Input Pin Voltage, 3.3V mode	VSS-0.3	VDD_3+0.3	V
Iin	Input Pin Current	-10	10	mA
Tstrg	Storage Temperature	-55	150	C
Tlead	Lead Temperature	N/A	260	C
ESD	Direct contact ESD	—	4	KV

## Recommend Operation Conditions

Symbol	Parameter	Min	Max	Units	Notes
Vdd_5V	5.0V DC Supply	4.5	5.5	V	(1)
Vdd_3V	3.3V DC Supply	2.73	3.6	V	(2)
Iddd	Dynamic Current		3	mA	(3)
Idds5	Standby Current		70	uA	5V mode(4)
Idds3	Standby Current		60	uA	3.3V mode(4)
Avss	Analog Ground	0	V		
Dvss	Digital Ground	0	V		
Ta	Ambient Temperature	-40	85	C	
Tj	Junction Temperature	-40	90	C	(5)

## External Component Parameters

Component	Function	Nominal	Tolerance	Units
Capacitor	Required decoupling capacitor for 3V or 5V applications	0.1	-20%, +20%	mF
Capacitor	Required decoupling only when used in 5V application	2.2	-20%, +20%	mF
Head Inductance	Head Inductance (per track)	100	+30, -60	mH (at 1kHz, 100mA RMS)
Head Resistance	Head DC Resistance (per track)	280	+/-30	Ohms
DATA Pin Capacitive Load	Capacitance that the DATA pins must drive at 19kHz. (parasitic)	50	Maximum	pF



## Pin I/O Descriptions

Pin #	Name	Pad Description
1	HD1A	Magnetic head input A (+) track 1
2	HD1B	Magnetic head input B (-) track 1
3	HD2A	Magnetic head input A (+) track 2
4	HD2B	Magnetic head input B (-) track 2
5	HD3A	Magnetic head input A (+) track 3
6	HD3B	Magnetic head input B (-) track 3
7	MSRD SPI	MSRD mode: connect to VDD_5V SPI mode: connect to GND
8	nCS	MSRD mode: not used (tie low) SPI mode: SPI chip select
9	CK1	MSRD mode: Track1 CLK
10	DA1	MSRD mode: Track1 DATA
11	CK2	MSRD mode: Track2 CLK
12	DA2	MSRD mode: Track2 DATA
13	CK3	MSRD mode: Track3 CLK
14	DA3	MSRD mode: Track3 DATA
15	MD MISO	MSRD mode: Media Detect, Open drain SPI mode: Slave Out, Normal Hi - Z
16	PRO SPCK	MSRD mode: PRO = 0: FIFO rate = swipe speed / 2 PRO = 1: FIFO rate = swipe speed SPI mode: SPI interface clock
17	MOSI	MSRD mode: not used (tie low) SPI mode: Slave input data
18	VDD_3V	3.3V operation: 3.3V supply voltage 5V operation: internal regulator decoupling capacitor
19	VDD_10	3.3V operation: 3.3V supply voltage 5V operation: 5V supply voltage
20	GND	Ground connection

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