# MIP512 (Tentative)

# Silicon MOSFET type Integrated Circuit

## Features

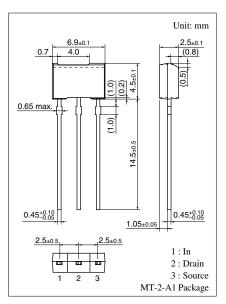
- Built-in five protection functions (over-current, over-voltage, loadshort-circuit, over heat, ESD)
- Both DC and AC power suply are available

### Applications

- Lamp · solenoid, and LED drive for Amusement machine
- Motor, Relay drive for Factory Automation

Absolute Maximum Ratings $T_C = 25^{\circ}C \pm 3^{\circ}C$							
Parameter	Symbol	Rating	Unit				
Drain-source voltage	V <sub>DS</sub>	45	V				
Output current	I <sub>O</sub>	2.0	А				
Input voltage	V <sub>IN</sub>	- 0.5 to +6.0	V				
Input current	I <sub>IN</sub>	±10	mA				
Power dissipation *	P <sub>D</sub>	1.0	W				
Operating ambient temperature	T <sub>opr</sub>	-40 to +85	°C				
Channel temperature	T <sub>ch</sub>	150	°C				
Storage temperature	T <sub>stg</sub>	-55 to +150	°C				



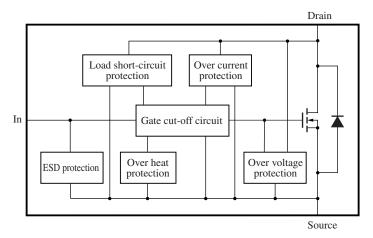


### Marking Symbol: MIP512

Note) \* : The value at mounting on the Printed circuit board

(glass epoxy board: 100 mm  $\times$  100 mm). (T<sub>a</sub> = 25°C)

# Block Diagram



### Electrical Characteristics $T_C = 25^{\circ}C \pm 3^{\circ}C$

Parameter	Symbol	Conditions	Min	Тур	Max	Unit
Drain-source on resistance	R <sub>DS(ON)</sub>	$V_{IN} = 5 V, I_{DS} = 1 A$		0.30	0.45	Ω
Drain-source voltage	V <sub>DS(ON)</sub>	$V_{IN} = 5 V, I_{DS} = 1 A$		0.30	0.45	V
Drain clamp voltage	V <sub>DS(CLP)</sub>	$V_{IN} = 0 V, I_{DS} = 3 mA$	45	52		V
Drain off current 1	I <sub>DS(OFF)1</sub>	$V_{IN} = 0 V, V_{DS} = 12 V$		5	20	μΑ
Drain off current 2	I <sub>DS(OFF)2</sub>	$V_{IN} = 0 V, V_{DS} = 25 V$		21	50	μΑ
Drain off current 3	I <sub>DS(OFF)3</sub>	$V_{IN} = 0 V, V_{DS} = 40 V$		55	120	μΑ
High level input voltage	V <sub>IN(H)</sub>	$I_{DS} = 1 A$	4			V
Low level input voltage	V <sub>IN(L)</sub>	$I_{DS} = 1 \text{ mA}$			0.8	V
Input current (normal state)	I <sub>IN(ON)</sub>	$V_{IN} = 5 V, V_{DS} = 0 V$		0.2	0.5	mA
Input current (protecting state) *	I <sub>IN(PROT)</sub>	V <sub>IN</sub> = 5 V		0.45	1.00	mA
Over current limit value	I <sub>OCP</sub>	$V_{IN} = 5 V$	3.5	5.0		А
Load short-circuit detection voltage	V <sub>DS(SHT)</sub>	V <sub>IN</sub> = 5 V	2	4		V

Note) 1. When the drain voltage is more than load shot-circuited detection voltage at the output on state, output current oscillates.

2. When a drain voltage rises above a drain clamp voltage (over-voltage protection operating voltage), the output MOS turns on and the drain voltage is clamped before breaking down between drain and source.

\*: The current value at the time when the load short-circuit protection and the over-heat protection are operating (for guarantee on design).

#### Electrical Characteristics (Reference Value)

Parameter	Symbol	Conditions	Min	Тур	Max	Unit
Cut-off temperature at overheat	T <sub>SHD</sub>	$V_{IN} = 5 V$		140		°C

Note) 1. The above characteristic is for the reference and is not guarantee value.

2. When the chip surface temperature rise above the shutdown temperature at the over- heat, the output is shut down. When the chip surface temperature falls, operation starts again.

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