MIP512 (Tentative)

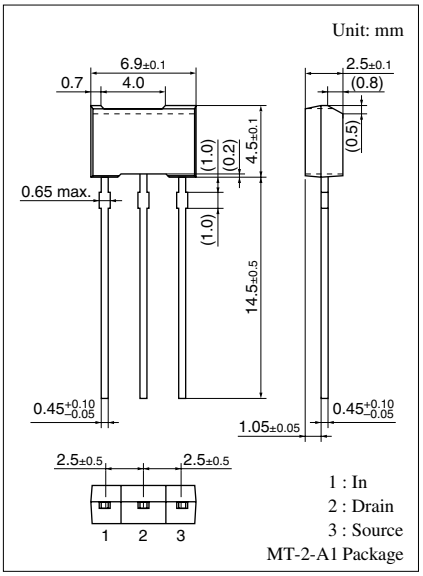
Silicon MOSFET type Integrated Circuit

■ Features

- Built-in five protection functions (over-current, over-voltage, load-short-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



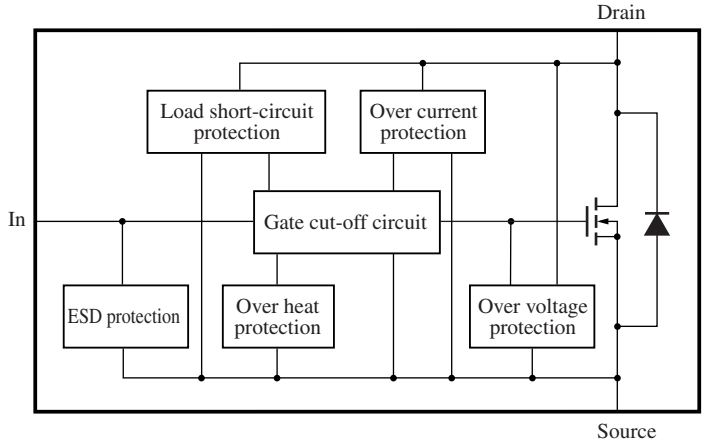
Marking Symbol: MIP512

■ Absolute Maximum Ratings $T_C = 25°C \pm 3°C$

Parameter	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	45	V
Output current	I_O	2.0	A
Input voltage	V_{IN}	− 0.5 to +6.0	V
Input current	I_{IN}	±10	mA
Power dissipation *	P_D	1.0	W
Operating ambient temperature	T_{opr}	−40 to +85	°C
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

Note) * : The value at mounting on the Printed circuit board (glass epoxy board: 100 mm × 100 mm). (T_a = 25°C)

■ Block Diagram



■ Electrical Characteristics $T_C = 25°C \pm 3°C$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source on resistance	$R_{DS(ON)}$	V_{IN} = 5 V, I_{DS} = 1 A		0.30	0.45	Ω
Drain-source voltage	$V_{DS(ON)}$	V_{IN} = 5 V, I_{DS} = 1 A		0.30	0.45	V
Drain clamp voltage	$V_{DS(CLP)}$	V_{IN} = 0 V, I_{DS} = 3 mA	45	52		V
Drain off current 1	$I_{DS(OFF)1}$	V_{IN} = 0 V, V_{DS} = 12 V		5	20	μA
Drain off current 2	$I_{DS(OFF)2}$	V_{IN} = 0 V, V_{DS} = 25 V		21	50	μA
Drain off current 3	$I_{DS(OFF)3}$	V_{IN} = 0 V, V_{DS} = 40 V		55	120	μA
High level input voltage	$V_{IN(H)}$	I_{DS} = 1 A	4			V
Low level input voltage	$V_{IN(L)}$	I_{DS} = 1 mA			0.8	V
Input current (normal state)	$I_{IN(ON)}$	V_{IN} = 5 V, V_{DS} = 0 V		0.2	0.5	mA
Input current (protecting state) *	$I_{IN(PROT)}$	V_{IN} = 5 V		0.45	1.00	mA
Over current limit value	I_{OCP}	V_{IN} = 5 V	3.5	5.0		A
Load short-circuit detection voltage	$V_{DS(SHT)}$	V_{IN} = 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	Typ	Max	Unit
Cut-off temperature at overheat	T_{SHD}	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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