MIP515

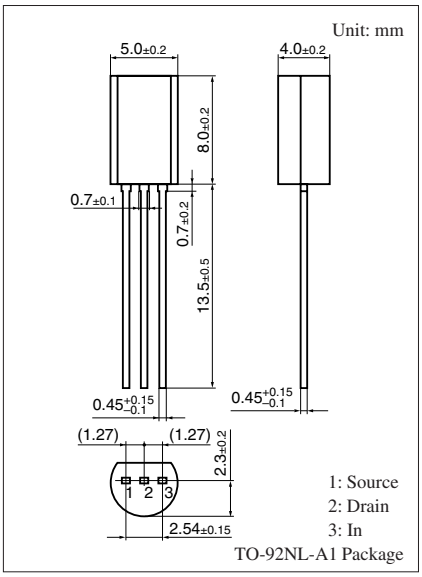
Silicon MOSFET type Integrated Circuit

■ 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 drive
- Motor drive



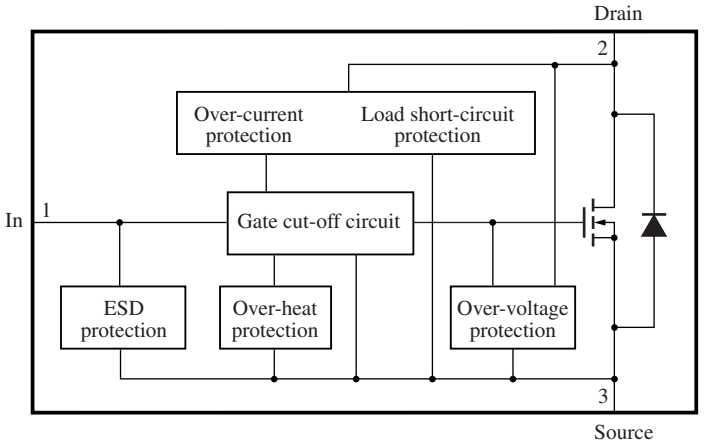
Marking Symbol: MIP515

■ Absolute Maximum Ratings $T_a = 25°C$

Parameter	Symbol	Rating	Unit
Output voltage	V_{DS}	− 0.5 to +45	V
Output current	I_O	2	A
Input voltage	V_{IN}	− 0.5 to +6.0	V
Input current	I_{IN}	±5	mA
Power dissipation *	P_D	1	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) ∗: Mounting on the PCB (100 mm × 100 mm × 1.7 mm, glass epoxy substrate).

■ Block Diagram



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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
On-resistance	$R_{DS(ON)}$	V_{IN} = 5 V, I_{DS} = 1 A		0.35	0.50	Ω
Drain to source on voltage	$V_{DS(ON)}$	V_{IN} = 5 V, I_{DS} = 1 A		0.35	0.50	V
Drain clamp voltage	$V_{DS(CLP)}$	V_{IN} = 0, I_{DS} = 3 mA	45	52		V
Drain-off current 1	$I_{DS(OFF)1}$	V_{IN} = 0, V_{DS} = 12 V		0.1	5.0	μA
Drain-off current 2	$I_{DS(OFF)2}$	V_{IN} = 0, V_{DS} = 25 V		0.2	8.0	
Drain-off current 3	$I_{DS(OFF)3}$	V_{IN} = 0, V_{DS} = 40 V		0.5	10.0	
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)	$I_{IN(ON)}$	V_{IN} = 5 V, V_{DS} = 0		0.2	0.5	mA
Input current (act on protection) *	$I_{IN(PROT)}$	V_{IN} = 5 V		0.45	1.00	mA
Over current protection limit (short circuit load protection limit)	I_{OCP} (V_{SHT})	V_{IN} = 5 V	2.5 (1.2)	4.0 (1.6)		A (V)

Note) 1. At on-state when drain voltage exceeds the "Short circuit load protection voltage", output current begin to oscillate.
2. When drain voltage exceeds the "drain clamp voltage" output MOS turn on, so drain voltage are clamped before the drain-source junction become breakdown.
3. *: State of short circuit load protection and over heat protection (designed guarantee).

■ Electrical Characteristics (Reference value: Non guarantee value)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Cutoff temperature at overheat	T_{SHD}	V_{IN} = 5 V		140		°C
Turn-on time	t_{ON}	V_{DD} = 30 V, R_L = 30 Ω		7		μs
Turn-off time	t_{OFF}	I_{DS} = 1 A, V_{IN} = 5 V		17		

Note) If the chip temperature exceeds the "over heat protection temperature", output current is shut down. And if the chip cool down, the protection will operate automatically again.

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