MIP516

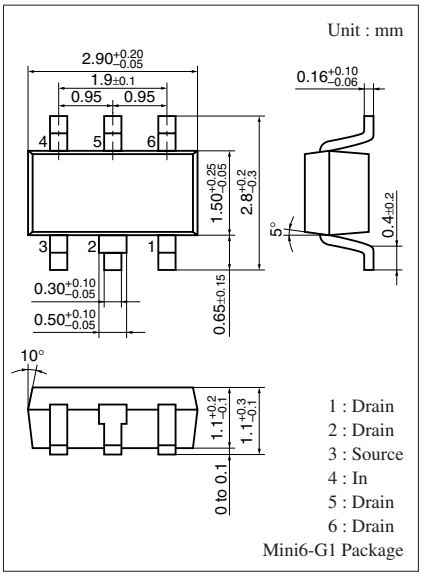
Silicon MOSFET type integrated circuit

■ Features

- Built-in five protection functions. (over-current, over-voltage, load-short-circuit, over heat, ESD)
- Driving directly from CMOS (microcomputer) is possible.
- It is exchangeable easily from a bipolar transistor and MOSFET
- The miniaturized package equipped with three terminals was adapted.

■ Applications

- Lamp-Solenoid, driver
- Motor driver



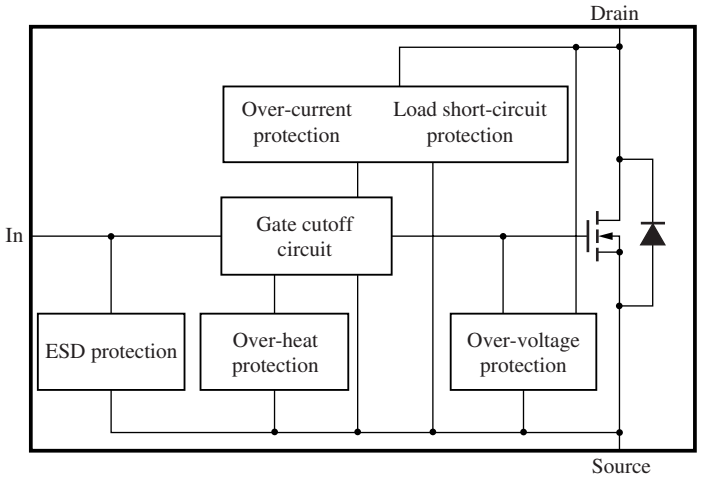
Marking Symbol: MB

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

Parameter	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	− 0.5 to +45	V
Output current	I_O	1.0	A
Input voltage	V_{IN}	− 0.5 to +6.0	V
Input current	I_{IN}	±2	mA
Drain clamp energy endurance *1	E_{CLP}	13	mJ
Power dissipation 1 *2	P_{D1}	0.2	W
Power dissipation 2 *3	P_{D2}	0.8	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) ∗1: L = 10 mH, I_L = 1.61 A, V_{DD} = 20 V, 1 pulse, T_C = 25°C
∗2: Single unit
*3: Mounting on the PCB (40 mm², thickness 1.7mm glass epoxy substrate) (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		0.70	0.90	Ω
Drain-source voltage	$V_{DS(on)}$	V_{IN} = 5 V, I_{DS} = 1 A		0.70	0.90	V
Drain clamp voltage	$V_{DS(CLP)}$	V_{IN} = 0 V, I_{DS} = 3 mA	45	52		V
Drain-source cutoff current 1	$I_{DS(off)1}$	V_{IN} = 0 V, V_{DS} = 12 V		0.01	5.00	μA
Drain-source cutoff current 2	$I_{DS(off)2}$	V_{IN} = 0 V, V_{DS} = 25 V		0.02	8.00	
Drain-source cutoff current 3	$I_{DS(off)3}$	V_{IN} = 0 V, V_{DS} = 40 V		0.08	10.00	
Input voltage high-level	$V_{IN(H)}$	I_{DS} = 0.5 A	4			V
Input voltage low-level	$V_{IN(L)}$	I_{DS} = 1 mA			0.80	V
Input current (normal)	$I_{IN(on)}$	V_{IN} = 5 V, V_{DS} = 0 V		0.3	0.5	mA
Input current (act on protection) *	$I_{IN(PROT)}$	V_{IN} = 5 V		0.75	1.10	mA
Over current protection limit	I_{OCP}	V_{IN} = 5 V	1.1	1.7		A
Short circuit load protection limit	$V_{DS(SHT)}$	V_{IN} = 5 V	1.0	1.6		V
Input voltage of act on protection	$V_{IN(PROT)}$		4.0	6.0		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 laod protection and over heat protection (designed guarantee).

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