

POWER MOS FET MODULE SILICON N CHANNEL MOS TYPE (L²-π-MOS[®] 4 IN 1)

MP4208

HIGH POWER HIGH SPEED SWITCHING APPLICATIONS

HAMMER DRIVE, PULSE MOTOR DRIVE AND INDUCTIVE LOAD SWITCHING

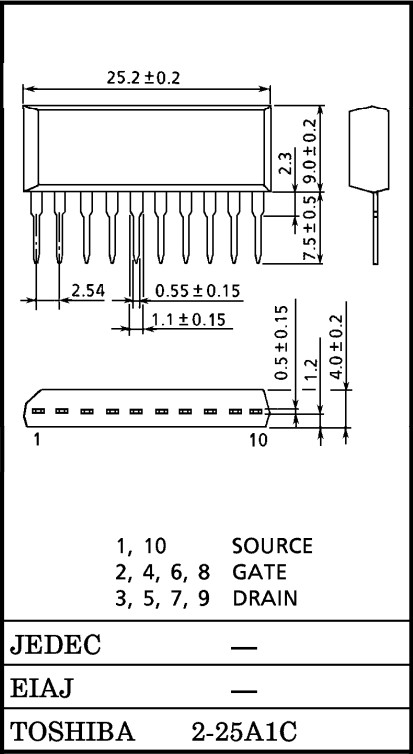
- -4-Volt Gate Drive Available
- Small Package by Full Molding (SIP 10 Pin)
- High Drain Power Dissipation (4 Devices Operation)
: P_T=4W (T_a=25°C)
- Low Drain-Source ON Resistance : R_{DS (ON)}=0.2Ω (Typ.)
- Low Leakage Current : I_{GSS}=±10μA (Max.) (V_{GS}=±16V)
I_{DSS}= -100μA (Max.) (V_{DS}= -60V)
- Enhancement-Mode : V_{th}= -0.8~-2.0V (I_D= -1mA)

MAXIMUM RATINGS (T_a = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V _{DSS}	-60	V
Gate-Source Voltage	V _{GSS}	±20	V
Drain Current	I _D	-5	A
Peak Drain Current	I _{DP}	-10	A
Drain Power Dissipation (1 Device Operation, T _a =25°C)	P _D	2.0	W
Drain Power Dissipation (4 Devices Operation, T _a =25°C)	P _{DT}	4.0	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature Range	T _{stg}	-55~150	°C

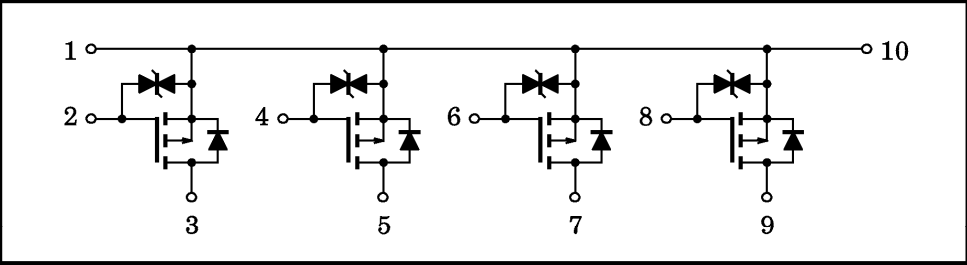
INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 2.1g

ARRAY CONFIGURATION



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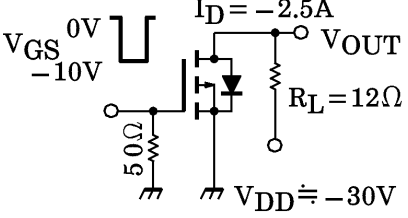
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THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance of Channel to Ambient (4 Devices Operation, $T_a = 25^\circ\text{C}$)	$\Sigma R_{th}(ch-a)$	31.3	$^\circ\text{C}/\text{W}$
Maximum Lead Temperature for Soldering Purposes (3.2mm from Case for 10 Second)	T_L	260	$^\circ\text{C}$

This Transistor is an Electrostatic Sensitive Device. Please Handle with Caution.

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16\text{V}, V_{DS} = 0$	—	—	± 10	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = -60\text{V}, V_{GS} = 0$	—	—	-100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = -10\text{mA}, V_{GS} = 0$	-60	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = -10\text{V}, I_D = -1\text{mA}$	-0.8	—	-2.0	V
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = -10\text{V}, I_D = -2.5\text{A}$	1	3	—	S
Drain-Source ON Resistance	$R_{DS(ON)}$		$I_D = -2.5\text{A}, V_{GS} = -4\text{V}$	—	0.3	0.5	Ω
	$R_{DS(ON)}$		$I_D = -2.5\text{A}, V_{GS} = -10\text{V}$	—	0.2	0.3	
Input Capacitance		C_{iss}	$V_{DS} = -10\text{V}, V_{GS} = 0, f = 1\text{MHz}$	—	630	—	pF
Reverse Transfer Capacitance		C_{rss}	$V_{DS} = -10\text{V}, V_{GS} = 0, f = 1\text{MHz}$	—	95	—	
Output Capacitance		C_{oss}	$V_{DS} = -10\text{V}, V_{GS} = 0, f = 1\text{MHz}$	—	290	—	
Switching Time	Rise Time	t_r	 $V_{IN} : t_r, t_f < 5\text{ns},$ $\text{Duty} \leq 1\%, t_w = 10\mu\text{s}$	—	25	—	ns
	Turn-on Time	t_{on}		—	45	—	
	Fall Time	t_f		—	55	—	
	Turn-off Time	t_{off}		—	200	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$I_D = -5\text{A}, V_{GS} = -10\text{V},$ $V_{DD} \doteq 48\text{V}$	—	22	—	nC
Gate-Source Charge		Q_{gs}		—	16	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	6	—	

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SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Drain Reverse Current	I_{DR}	—	—	—	−5	A
Peak Drain Reverse Current	I_{DRP}	—	—	—	−10	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = -5A, V_{GS} = 0$	—	1.0	2.0	V
Reverse Recovery Time	t_{rr}	$I_{DR} = -5A, V_{GS} = 0$ $dI_{DR} / dt = -50A / \mu s$	—	80	—	ns
Reverse Recovery Charge	Q_{rr}		—	0.1	—	μC

