

TOSHIBA POWER MOS FET MODULE SILICON N CHANNEL MOS TYPE (L²-π-MOSV 4 IN 1)

MP4410

HIGH POWER, HIGH SPEED SWITCHING APPLICATIONS

HAMMER DRIVE, PULSE MOTOR DRIVE AND INDUCTIVE LOAD SWITCHING

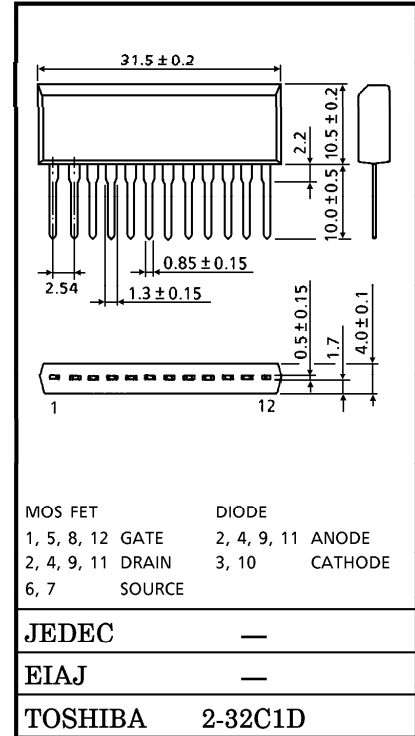
INDUSTRIAL APPLICATIONS

Unit in mm

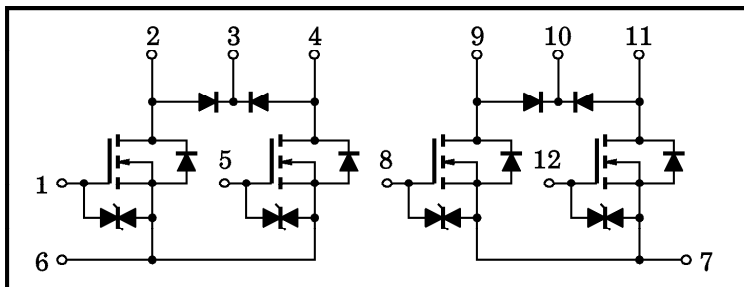
- 4-Volt Gate Drive Available
- Small Package by Full Molding (SIP 12 Pin)
- High Drain Power Dissipation (4 Devices Operation)
: P_T = 28W (T_c = 25°C)
- Low Drain-Source ON Resistance : R_{DS(ON)} = 0.12Ω (Typ.)
- Low Leakage Current : I_{GSS} = ±10μA (Max.) (V_{GS} = ±16V)
I_{DSS} = 100μA (Max.) (V_{DS} = 60V)
- Enhancement-Mode : V_{th} = 0.8~2.0V (I_D = 1mA)

MAXIMUM RATINGS (Ta = 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}	20	
Drain Power Dissipation (1 Device Operation)	P _D	2.2	W
Drain Power Dissipation (4 Devices Operation)	P _T	Ta = 25°C	4.4
		Tc = 25°C	28
Channel Temperature	T _{ch}	150	°C
Storage Temperature Range	T _{stg}	-55~150	°C



ARRAY CONFIGURATION



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Thermal Characteristics

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance of Channel to Ambient (4 Devices Operation, Ta=25°C)	$\Sigma R_{th(ch-a)}$	28.4	°C / W
Thermal Resistance of Channel to Case (4 Devices Operation, Tc=25°C)	$\Sigma R_{th(ch-c)}$	4.46	°C / W
Maximum Lead Temperature for Soldering Purposes (3.2mm from Case for 10s)	T _L	260	°C

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

Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I _{GSS}	V _{GS} = ±16V, V _{DS} = 0	—	—	±10	μA	
Drain Cut-off Current	I _{DSS}	V _{DS} = 60V, V _{GS} = 0	—	—	100	μA	
Drain-Source Breakdown Voltage	V (BR) DSS	I _D = 10mA, V _{GS} = 0	60	—	—	V	
Gate Threshold Voltage	V _{th}	V _{DS} = 10V, I _D = 1mA	0.8	—	2.0	V	
Forward Transfer Admittance	Y _{fs}	V _{DS} = 10V, I _D = 2.5A	3.0	5.0	—	S	
Drain-Source ON Resistance	R _{DS (ON)}	I _D = 2.5A, V _{GS} = 4V	—	0.21	0.31	Ω	
		I _D = 2.5A, V _{GS} = 10V	—	0.12	0.16		
Input Capacitance	C _{iSS}	V _{DS} = 10V, V _{GS} = 0, f = 1MHz	—	370	—	pF	
Reverse Transfer Capacitance	C _{rSS}		—	60	—		
Output Capacitance	C _{oss}		—	180	—		
Switching Time	Rise Time	t _r		—	18	—	ns
	Turn-on Time	t _{on}		—	25	—	
	Fall Time	t _f		—	15	—	
	Turn-off Time	t _{off}		—	170	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q _g	I _D = 5A, V _{GS} = 10V, V _{DD} = 48V	—	12	—	nC	
Gate-Source Charge	Q _{gs}		—	8	—		
Gate-Drain (“Miller”) Charge	Q _{gd}		—	4	—		

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}	—	—	—	20	A
Diode Forward Voltage	V_{DSF}	$I_{DR}=5A, V_{GS}=0$	—	—	-1.7	V

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Maximum Forward Current	I_{FM}	—	—	—	5	A
Reverse Current	I_R	$V_R=120V$	—	—	0.4	μA
Reverse Voltage	V_R	$I_R=100\mu A$	120	—	—	V
Forward Voltage	V_F	$I_F=1A$	—	—	1.8	V