

TOSHIBA POWER MOS FET MODULE SILICON P CHANNEL MOS TYPE (L<sup>2</sup>-π-MOSIII 4 IN 1)

# MP4203

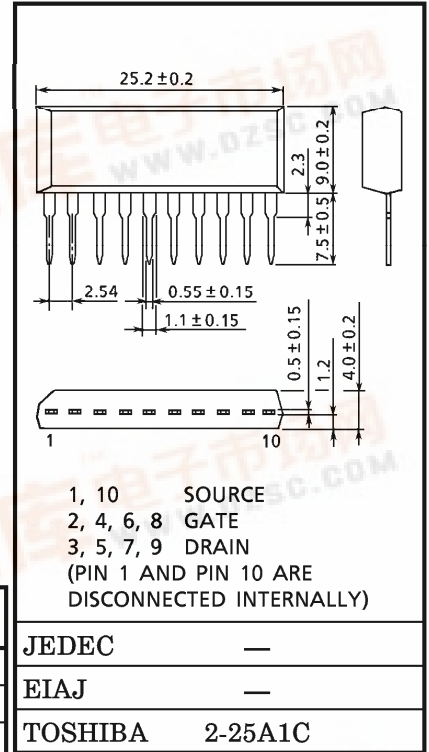
## HIGH POWER SWITCHING APPLICATIONS

HAMMER DRIVE, PULSE MOTOR DRIVE AND INDUCTIVE LOAD SWITCHING

- 4V Gate Drive Available
- Small Package by Full Molding (SIP 10 Pin)
- High Collector Power Dissipation (4 Devices Operation)  
: P<sub>T</sub> = 4W (T<sub>a</sub> = 25°C)
- Low Drain-Source ON Resistance : R<sub>DS (ON)</sub> = 0.3Ω (Typ.)
- Low Leakage Current : I<sub>GSS</sub> = ±10μA (Max.) (V<sub>GS</sub> = ±16V)  
I<sub>DSS</sub> = -100μA (Max.) (V<sub>DS</sub> = -60V)
- Enhancement-Mode : V<sub>th</sub> = -0.8 ~ -2.0V (I<sub>D</sub> = -1mA)

## INDUSTRIAL APPLICATIONS

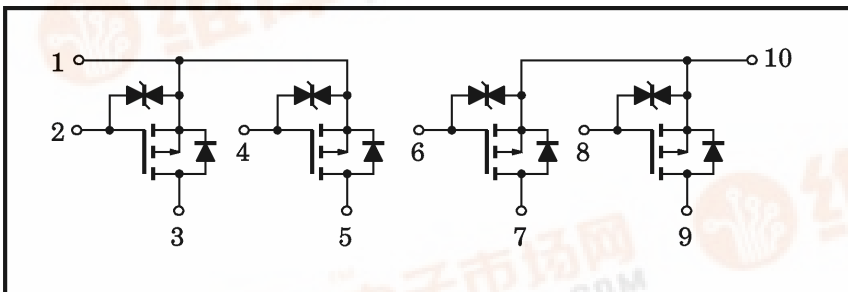
Unit in mm



## MAXIMUM RATINGS (T<sub>a</sub> = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V <sub>DS</sub>	-60	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current	I <sub>D</sub>	-5	A
Peak Drain Current	I <sub>DP</sub>	-10	A
Drain Power Dissipation (1 Device Operation)	P <sub>D</sub>	2.0	W
Drain Power Dissipation (4 Devices Operation)	P <sub>DT</sub>	4.0	W
Chennel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature Range	T <sub>stg</sub>	-55~150	°C

## ARRAY CONFIGURATION



**THERMAL CHARACTERISTICS**

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance of Channel to Ambient (4 Devices Operation, Ta=25°C)	$\Sigma R_{th(ch-a)}$	31.2	°C/W
Maximum Lead Temperature for Soldering Purposes (3.2mm from Case for 10s)	T <sub>L</sub>	260	°C

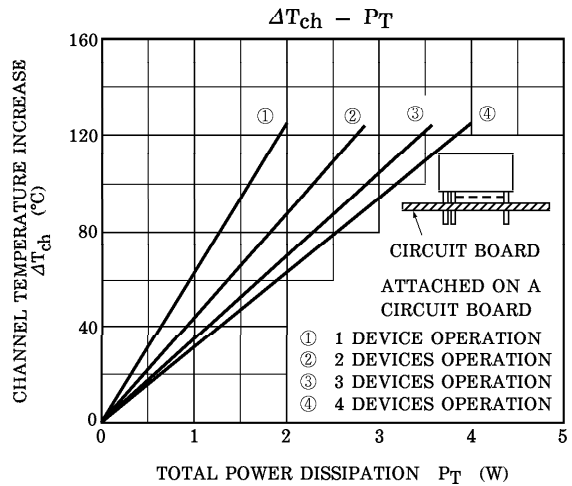
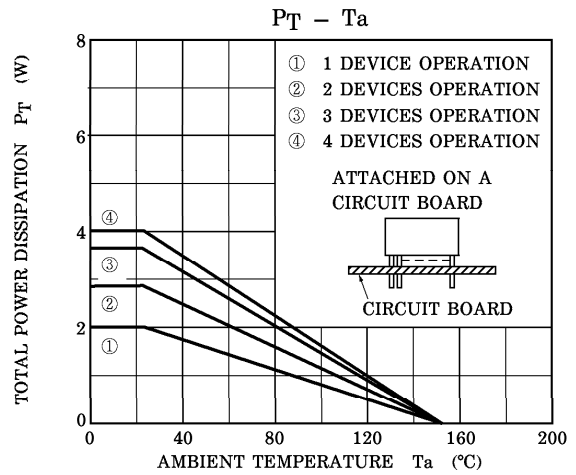
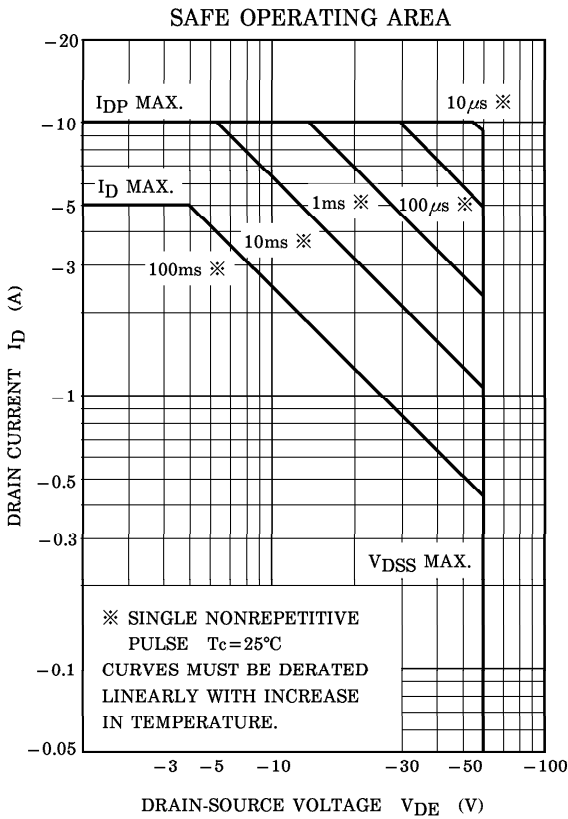
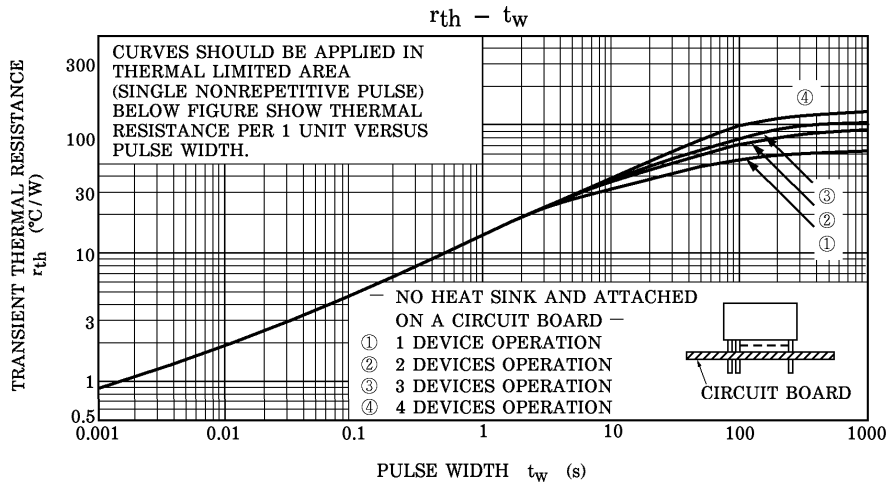
This Transistor is an Electrostatic Sensitive Device. Please Handle with Caution.

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±16V, V <sub>DS</sub> = 0	—	—	±10	μA	
Drain Cut-off Current	I <sub>DSS</sub>	V <sub>DS</sub> = -60V, V <sub>GS</sub> = 0	—	—	-100	μA	
Drain-Source Breakdown Voltage	V(BR)DSS	I <sub>D</sub> = -10mA, V <sub>GS</sub> = 0	-60	—	—	V	
Gate Threshold Voltage	V <sub>th</sub>	V <sub>DS</sub> = -10V, I <sub>D</sub> = -1mA	-0.8	—	-2.0	V	
Drain-Source ON Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = -4V, I <sub>D</sub> = -2.5A	—	0.45	0.8	Ω	
		V <sub>GS</sub> = -10V, I <sub>D</sub> = -2.5A	—	0.30	0.4		
Forward Transfer Admittance	Y <sub>fs</sub>	V <sub>DS</sub> = -10V, I <sub>D</sub> = -2.5A	1.0	2.0	—	S	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0, f = 1MHz	—	380	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>		—	90	—		
Output Capacitance	C <sub>oss</sub>		—	270	—		
Switching Time	Rise Time	t <sub>r</sub>		—	30	—	ns
	Turn-on Time	t <sub>on</sub>		—	50	—	
	Fall Time	t <sub>f</sub>		—	48	—	
	Turn-off Time	t <sub>off</sub>		V <sub>IN</sub> : t <sub>r</sub> , t <sub>f</sub> < 5ns Duty ≤ 1% t <sub>w</sub> = 10μs	—	120	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q <sub>g</sub>	V <sub>DD</sub> = -48V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -5A	—	20	—	nC	
Gate-Source Charge	Q <sub>gs</sub>		—	12	—		
Gate-Drain (“Miller”) Charge	Q <sub>gd</sub>		—	8	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Drain Reverse Current	I <sub>DR</sub>	—	—	—	-5	A
Peak Drain Reverse Current	I <sub>DRP</sub>	—	—	—	-10	A
Diode Forward Voltage	V <sub>DSF</sub>	I <sub>DR</sub> = -5A, V <sub>GS</sub> = 0	—	1.0	1.6	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>DR</sub> = -5A, V <sub>GS</sub> = 0	—	170	—	ns
Reverse Recovery Charge	Q <sub>rr</sub>	dI <sub>DR</sub> / dt = -20A / μs	—	0.42	—	μC



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