TOSHIBA POWER MOS FET MODULE SILICON P CHANNEL MOS TYPE (L^2-π-MOSIII 4 IN 1)

MP4203

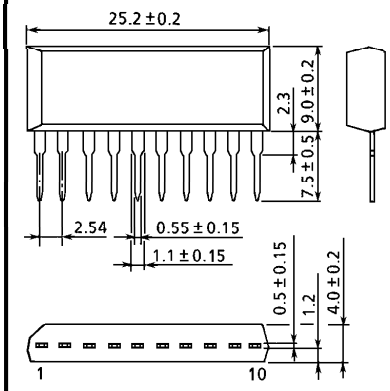
HIGH POWER SWITCHING APPLICATIONS

HAMMER DRIVE, PULSE MOTOR DRIVE AND INDUCTIVE LOAD SWITCHING

INDUSTRIAL APPLICATIONS

- 4V Gate Drive Available
- Small Package by Full Molding (SIP 10 Pin)
- High Collector Power Dissipation (4 Devices Operation)
  : P_T = 4W (Ta = 25°C)
- Low Drain-Source ON Resistance : $R_{DS\ (ON)}$ = 0.3Ω (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)

Unit in mm



1, 10 SOURCE
2, 4, 6, 8 GATE
3, 5, 7, 9 DRAIN
(PIN 1 AND PIN 10 ARE DISCONNECTED INTERNALLY)

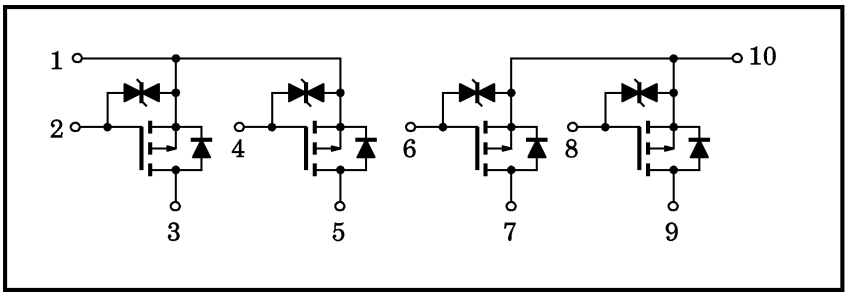
JEDEC	—
EIAJ	—
TOSHIBA	2-25A1C

Weight : 2.1g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	−60	V
Gate-Source Voltage	VGSS	±20	V
Drain Current	I_D	−5	A
Peak Drain Current	I_{DP}	−10	A
Drain Power Dissipation (1 Device Operation)	P_D	2.0	W
Drain Power Dissipation (4 Devices Operation)	P_{DT}	4.0	W
Chennel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	−55~150	°C

ARRAY CONFIGURATION



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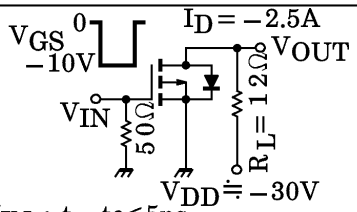
THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance of Channel to Ambient (4 Devices Operation, Ta = 25°C)	$\Sigma R_{th\,(ch\text{-}a)}$	31.2	°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.

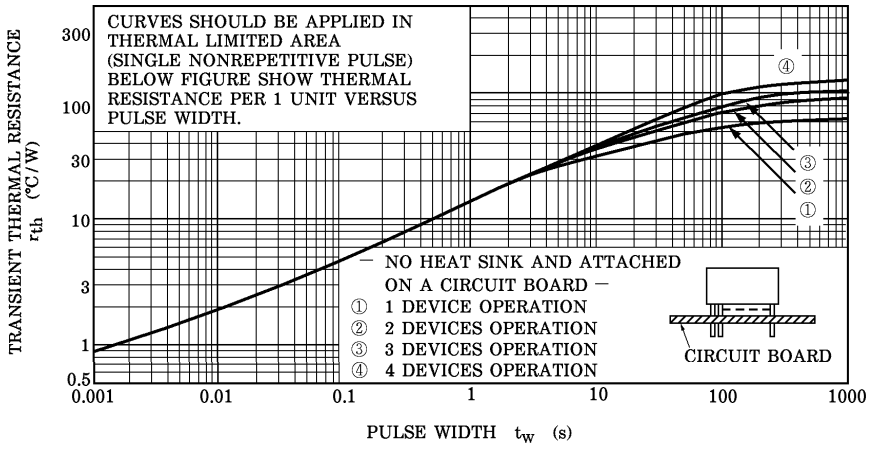
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16V$, $V_{DS} = 0$	—	—	±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
Drain-Source ON Resistance		$R_{DS\,(ON)}$	$V_{GS} = -4V$, $I_D = -2.5A$	—	0.45	0.8	Ω
			$V_{GS} = -10V$, $I_D = -2.5A$	—	0.30	0.4	
Forward Transfer Admittance		$\|Y_{fs}\|$	$V_{DS} = -10V$, $I_D = -2.5A$	1.0	2.0	—	S
Input Capacitance		C_{iss}	$V_{DS} = -10V$, $V_{GS} = 0$, f = 1MHz	—	380	—	pF
Reverse Transfer Capacitance		C_{rss}		—	90	—	
Output Capacitance		C_{oss}		—	270	—	
Switching Time	Rise Time	t_r		—	30	—	ns
	Turn-on Time	t_{on}		—	50	—	
	Fall Time	t_f		—	48	—	
	Turn-off Time	toff	V_{IN} : t_r, $t_f < 5ns$ Duty ≦ 1% $t_w = 10\mu s$	—	120	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \fallingdotseq -48V$, $V_{GS} = -10V$, $I_D = -5A$	—	20	—	nC
Gate-Source Charge		Q_{gs}		—	12	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	8	—	

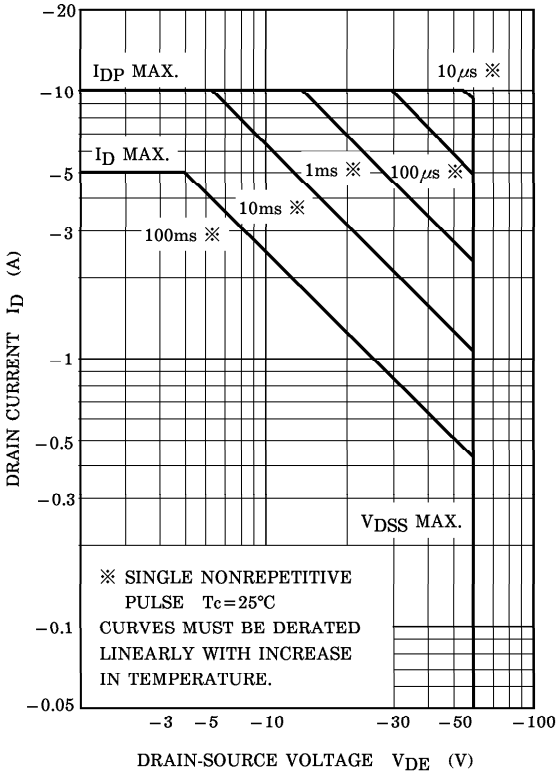
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

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	1.6	V
Reverse Recovery Time	t_{rr}	$I_{DR} = -5A$, $V_{GS} = 0$	—	170	—	ns
Reverse Recovery Charge	Q_{rr}	$dI_{DR} / dt = -20A / \mu s$	—	0.42	—	μC

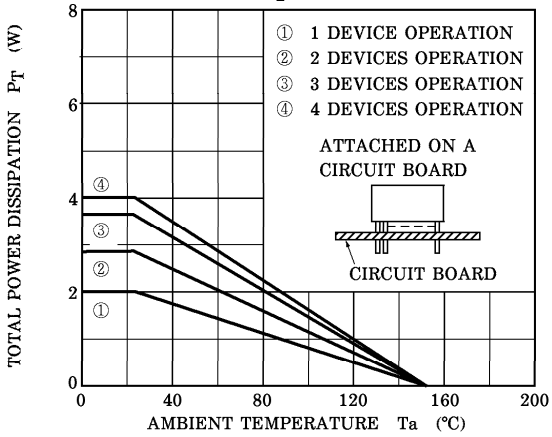
r_{th} – t_w



SAFE OPERATING AREA



P_T – Ta



ΔT_{ch} – P_T