

1. TYPE EM6M2
2. STRUCTURE SILICON N-CHANNEL / P-CHANNEL MOS FET
3. APPLICATIONS SWITCHING
4. ABSOLUTE MAXIMUM RATINGS [Ta=25°C]

《 Tr1 : Nch 》

DRAIN-SOURCE VOLTAGE		V_{DSS}	• • •	20V
GATE-SOURCE VOLTAGE		V_{GSS}	• • •	$\pm 8V$
DRAIN CURRENT	CONTINUOUS	I_D	• • •	$\pm 200mA$
	PULSED	I_{DP}	• • •	$\pm 400mA$ $PW \leq 10\mu s$ DUTY CYCLE $\leq 1\%$

《 Tr2 : Pch 》

DRAIN-SOURCE VOLTAGE		V_{DSS}	• • •	-20V
GATE-SOURCE VOLTAGE		V_{GSS}	• • •	$\pm 10V$
DRAIN CURRENT	CONTINUOUS	I_D	• • •	$\pm 200mA$
	PULSED	I_{DP}	• • •	$\pm 400mA$ $PW \leq 10\mu s$ DUTY CYCLE $\leq 1\%$

《 Tr1 AND Tr2 》

POWER DISSIPATION		P_D	• • •	150mW / TOTAL 120mW / ELEMENT EACH TERMINAL MOUNTED ON A RECOMMENDED LAND
CHANNEL TEMPERATURE		T_{ch}	• • •	150°C
RANGE OF STORAGE TEMPERATURE		T_{stg}	• • •	- 55~150°C

DESIGN	CHECK	APPROVAL	DATE : 05/JAN/2009	SPECIFICATION No. TSQ03103H-EM6M2
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5.ELECTRICAL CHARACTERISTICS [Ta=25°C]

《 Tr1 Nch MOSFET 》

PARAMETER	ITEM	CONDITION	MIN.	TYP.	MAX.
GATE-SOURCE LEAKAGE	I _{GSS}	V _{GS} =±8V/V _{DS} =0V	—	—	±10μA
DRAIN-SOURCE BREAKDOWN VOLTAGE	V _{(BR)DSS}	I _D =1mA/V _{GS} =0V	20V	—	—
ZERO GATE VOLTAGE DRAIN CURRENT	I _{DSS}	V _{DS} =20V/V _{GS} =0V	—	—	1μA
GATE THRESHOLD VOLTAGE	V _{GS(th)}	V _{DS} =10V/I _D =1mA	0.3V	—	1.0V
STATIC DRAIN-SOURCE ON-STATE RESISTANCE	R _{DS(on)} * PULSED	I _D =200mA/V _{GS} =4.0V	—	0.7Ω	1.0Ω
		I _D =200mA/V _{GS} =2.5V	—	0.8Ω	1.2Ω
		I _D =200mA/V _{GS} =1.8V	—	1.0Ω	1.4Ω
		I _D =40mA/V _{GS} =1.5V	—	1.2Ω	2.4Ω
		I _D =20mA/V _{GS} =1.2V	—	1.6Ω	4.8Ω
FORWARD TRANSFER ADMITTANCE	Y _{fs} * PULSED	V _{DS} =10V/I _D =200mA	0.2S	—	—
INPUT CAPACITANCE	C _{iss}	V _{DS} =10V V _{GS} =0V f=1MHz	—	25pF	—
OUTPUT CAPACITANCE	C _{oss}		—	10pF	—
REVERSE TRANSFER CAPACITANCE	C _{rss}		—	10pF	—
TURN-ON DELAY TIME	t _{d(on)} * PULSED	V _{DD} ≐10V I _D =150mA V _{GS} =4.0V R _L ≐67Ω R _G =10Ω See Fig.1-1,1-2	—	5ns	—
RISE TIME	t _r * PULSED		—	10ns	—
TURN-OFF DELAY TIME	t _{d(off)} * PULSED		—	15ns	—
FALL TIME	t _f * PULSED		—	10ns	—

BODY DIODE CHARACTERISTICS (SOURCE-DRAIN)

PARAMETER	ITEM	CONDITION	MIN.	TYP.	MAX.
FORWARD VOLTAGE	V _{SD} * PULSED	I _S =100mA/V _{GS} =0V	—	—	1.2V

6.ELECTRICAL CHARACTERISTICS [Ta=25 °C]

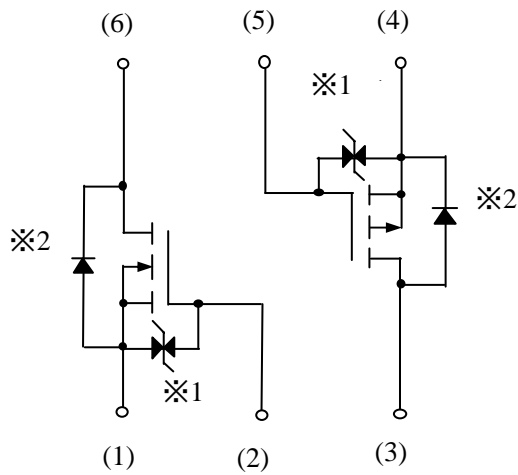
《 Tr2 Pch MOSFET 》

PARAMETER	ITEM	CONDITION	MIN.	TYP.	MAX.
GATE-SOURCE LEAKAGE	I_{GSS}	$V_{GS} = \pm 10V / V_{DS} = 0V$	—	—	$\pm 10 \mu A$
DRAIN-SOURCE BREAKDOWN VOLTAGE	$V_{(BR)DSS}$	$I_D = -1mA / V_{GS} = 0V$	-20V	—	—
ZERO GATE VOLTAGE DRAIN CURRENT	I_{DSS}	$V_{DS} = -20V / V_{GS} = 0V$	—	—	$-1 \mu A$
GATE THRESHOLD VOLTAGE	$V_{GS(th)}$	$V_{DS} = -10V / I_D = -100\mu A$	-0.3V	—	-1.0V
STATIC DRAIN-SOURCE ON-STATE RESISTANCE	$R_{DS(on)}$ * PULSED	$I_D = -200mA / V_{GS} = -4.5V$	—	0.8 Ω	1.2 Ω
		$I_D = -100mA / V_{GS} = -2.5V$	—	1.0 Ω	1.5 Ω
		$I_D = -100mA / V_{GS} = -1.8V$	—	1.3 Ω	2.2 Ω
		$I_D = -40mA / V_{GS} = -1.5V$	—	1.6 Ω	3.5 Ω
		$I_D = -10mA / V_{GS} = -1.2V$	—	2.4 Ω	9.6 Ω
FORWARD TRANSFER ADMITTANCE	$ Y_{fs} $ * PULSED	$V_{DS} = -10V / I_D = -200mA$	0.2S	—	—
INPUT CAPACITANCE	C_{iss}	$V_{DS} = -10V$ $V_{GS} = 0V$ $f = 1MHz$	—	115pF	—
OUTPUT CAPACITANCE	C_{oss}		—	10pF	—
REVERSE TRANSFER CAPACITANCE	C_{rss}		—	6pF	—
TURN-ON DELAY TIME	$t_{d(on)}$ * PULSED		$V_{DD} \doteq -10V$ $I_D = -100mA$ $V_{GS} = -4.5V$ $R_L \doteq 100 \Omega$ $R_G = 10 \Omega$ See Fig 2-1.2-2	—	6ns
RISE TIME	t_r * PULSED	—		4ns	—
TURN-OFF DELAY TIME	$t_{d(off)}$ * PULSED	—		17ns	—
FALL TIME	t_f * PULSED	—		17ns	—

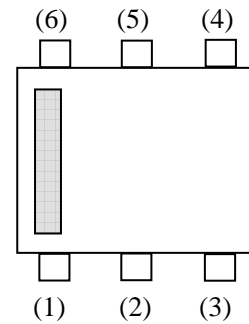
BODY DIODE CHARACTERISTICS (SOURCE-DRAIN)

PARAMETER	ITEM	CONDITION	MIN.	TYP.	MAX.
FORWARD VOLTAGE	V_{SD} * PULSED	$I_S = -200mA / V_{GS} = 0V$	—	—	-1.2V

7. INNER CIRCUIT

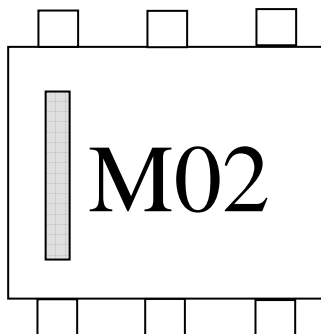


- (1) Tr 1 Source
- (2) Tr 1 Gate
- (3) Tr 2 Drain
- (4) Tr 2 Source
- (5) Tr 2 Gate
- (6) Tr 1 Drain



- ※ 1 ESD PROTECTION DIODE
- ※ 2 BODY DIODE

8. MARKING



“M02” MEANS EM6M2.

9. MEASUREMENT CIRCUIT 《Nch》

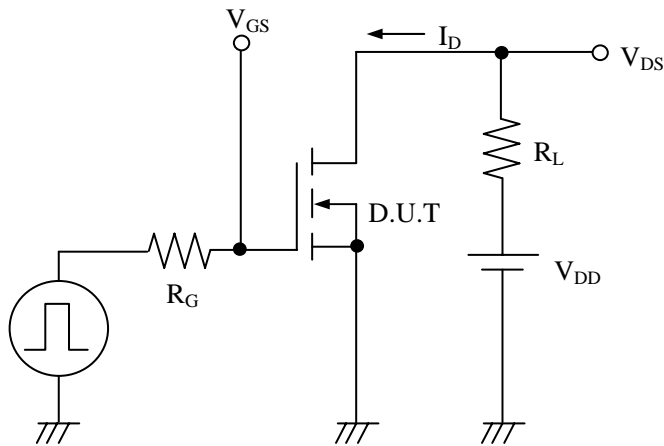


Fig.1-1 SWITCHING TIME MEASUREMENT CIRCUIT

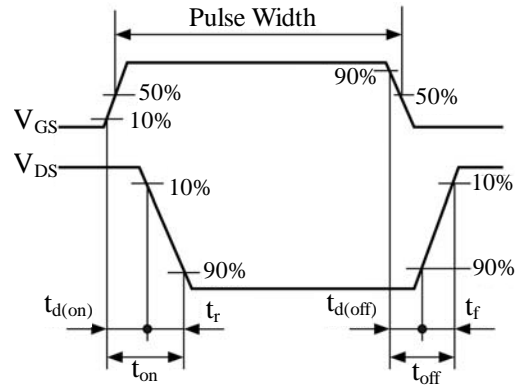


Fig.1-2 SWITCHING WAVEFORMS

10. MEASUREMENT CIRCUIT 《Pch》

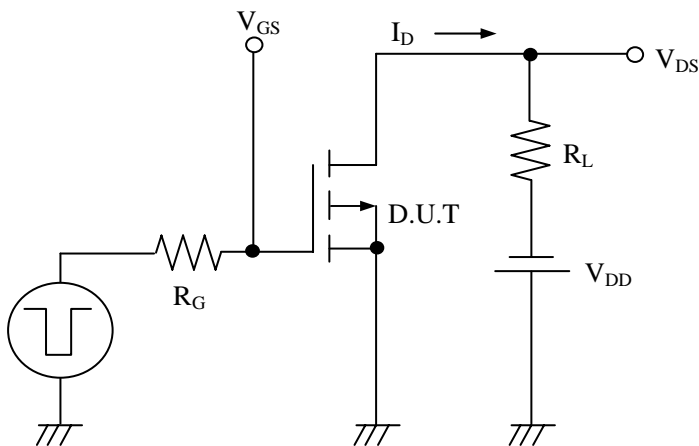


Fig.2-1 SWITCHING TIME MEASUREMENT CIRCUIT

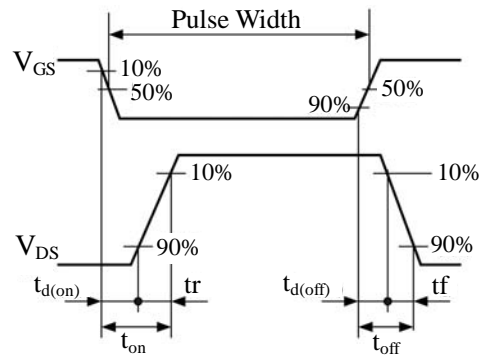


Fig.2-2 SWITCHING WAVEFORMS

11. Notice

This product might cause chip aging and breakdown under the large electrified environment.
Please consider to design ESD protection circuit.