

### Field Effect Transistor

#### Silicon N Channel MOS Type (L<sup>2</sup>-π-MOS III)

#### High Speed, High Current DC-DC Converter,

#### Relay Drive and Motor Drive Applications

#### Features

- 4-Volt Gate Drive
- Low Drain-Source ON Resistance
  - $R_{DS(ON)} = 0.12\Omega$  (Typ.)
- High Forward Transfer Admittance
  - $|Y_{fs}| = 3.5S$  (Typ.)
- Low Leakage Current
  - $I_{GSS} = \pm 5\mu A$  (Max.) @  $V_{GS} = \pm 16V$
  - $I_{DSS} = 100\mu A$  (Max.) @  $V_{DS} = 60V$
- Enhancement-Mode
  - $V_{th} = -0.8 \sim 2.0V$  @  $V_{DS} = 10V, I_D = 1mA$

#### Absolute Maximum Ratings (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	$V_{DSS}$	60	V
Drain-Gate Voltage ( $R_{GS} = 20k\Omega$ )	$V_{DGR}$	60	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	5
	Pulse	$I_{DP}$	20
Drain Power Dissipation (Tc = 25°C)	$P_D$	20	W
Channel Temperature	$T_{ch}$	150	°C
Storage Temperature Range	$T_{stg}$	-55 ~ 150	°C

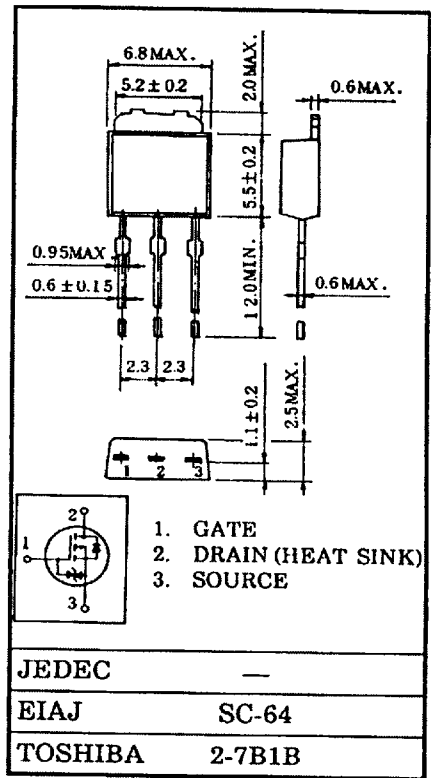
#### Thermal Characteristics

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	6.25	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	125	°C/W

This transistor is an electrostatic sensitive device. Please handle with care.

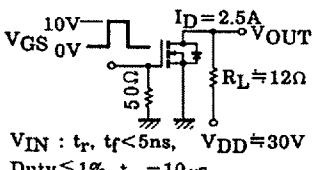
#### Industrial Applications

Unit in mm



Weight : 0.36g

## Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		$I_{GSS}$	$V_{GS} = \pm 16V, V_{DS} = 0V$	-	-	$\pm 5$	$\mu A$
Drain Cut-off Current		$I_{DSS}$	$V_{DS} = 60V, V_{GS} = 0V$	-	-	100	$\mu A$
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10mA, V_{GS} = 0V$	60	-	-	V
Gate Threshold Voltage		$V_{th}$	$V_{DS} = 10V, I_D = 1mA$	0.8	-	2.0	V
ON State Drain Current		$I_D (ON)$	$V_{DS} = 4V, V_{GS} = 4A$	2.5	-	-	A
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 4V, I_D = 1.3A$	-	0.20	0.30	$\Omega$
			$V_{GS} = 10V, I_D = 2.5A$	-	0.12	0.16	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10V, I_D = 2.5A$	2.0	3.5	-	S
Input Capacitance		$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V,$ $f = 1MHz$	-	380	530	pF
Reverse Transfer Capacitance		$C_{rss}$		-	95	150	
Output Capacitance		$C_{oss}$		-	280	400	
Switching Time	Rise Time	$t_r$	 <p><math>V_{IN} : t_r, t_f &lt; 5ns, V_{DD} = 30V</math> Duty <math>\leq 1\%, t_w = 10\mu s</math></p>	-	12	30	ns
	Turn-on Time	$t_{on}$		-	20	40	
	Fall Time	$t_f$		-	50	100	
	Turn-off Time	$t_{off}$		-	140	280	
Total Gate Charge (Gate-Source Plus Gate-Drain)		$Q_g$	$V_{DD} = 48V, V_{GS} = 10V,$ $I_D = 5A$	-	20	40	nC
Gate-Source Charge		$Q_{gs}$		-	12	-	
Gate-Drain ("Miller") Charge		$Q_{gd}$		-	8	-	

## Source-Drain Diode Ratings and Characteristics (Ta = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	$I_{DR}$	-	-	-	5	A
Pulse Drain Reverse Current	$I_{DRP}$	-	-	-	20	A
Diode Forward Voltage	$V_{DSF}$	$I_{DR} = 5A, V_{GS} = 0V$	-	-1.0	-1.7	V
Reverse Recovery Time	$t_{rr}$	$I_{DR} = 5A, V_{GS} = 0V$	-	120	-	ns
Reverse Recovered Charge	$Q_{rr}$	$dI_{DR}/dt = 20A/\mu s$	-	0.09	-	$\mu C$

