

Field Effect Transistor

Silicon N Channel MOS Type (L^2 - π -MOS IV)

High Speed Switching, DC-DC Converter,
Relay Drive, Motor Drive Applications

Features

- 4-Volt Gate Drive
- Low Drain-Source ON Resistance
 - $R_{DS(ON)} = 15m\Omega$ (Typ.)
- High Forward Transfer Admittance
 - $|Y_{fs}| = 26S$ (Typ.)
- Low Leakage Current
 - $I_{DSS} = 100\mu A$ (Max.) @ $V_{DS} = 60V$
- Enhancement-Mode
 - $V_{th} = 0.8 \sim 2.0V$ @ $V_{DS} = 10V, I_D = 1mA$

Absolute Maximum Ratings (Ta = 25C)

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}	± 20	V
Drain Current	DC	I_D	45
	Pulse	I_{DP}	180
Drain Power Dissipation (Tc = 25°C)	P_D	100	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{lg}	-55 ~ 150	°C

Thermal Characteristics

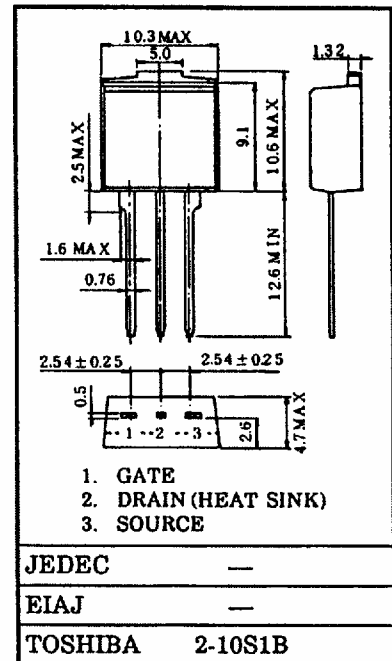
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{\theta(ch-c)}$	1.25	°C/W
Thermal Resistance, Channel to Ambient	$R_{\theta(ch-a)}$	83.3	°C/W

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

Industrial Applications

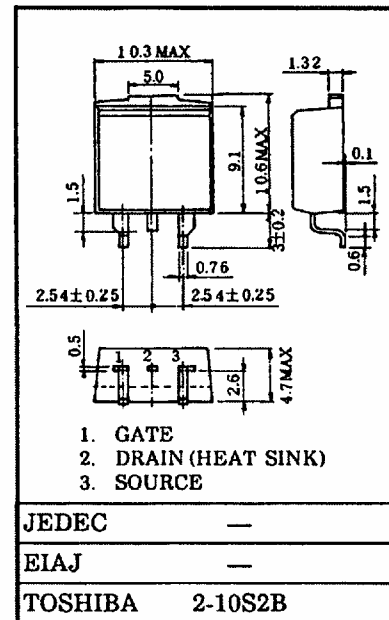
TO-220FL

Unit in mm



TO-220SM

Unit in mm



Weight: 1.5g

Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$	-	-	100	μA
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
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 4V, I_D = 20A$	-	22	35	Ω
			$V_{GS} = 10V, I_D = 20A$	-	15	20	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10V, I_D = 20A$	18	26	-	S
Input Capacitance		C_{iss}	$V_{DS} = 10V, V_{GS} = 0V,$ $f = 1MHz$	-	2750	3800	pF
Reverse Transfer Capacitance		C_{rss}		-	600	1000	
Output Capacitance		C_{oss}		-	1500	2200	
Switching Time	Rise Time	t_r	<p>$I_D = 20A$ $V_{GS} = 10V$ $R_L = 1.5\Omega$ $V_{IN} : t_r, t_f < 5ns, V_{DD} = 30V$ Duty $\leq 1\%$, $t_w = 10\mu s$</p>	-	20	40	ns
	Turn-on Time	t_{on}		-	60	120	
	Fall Time	t_f		-	80	160	
	Turn-off Time	t_{off}		-	210	400	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = 48V, V_{GS} = 10V,$ $I_D = 45A$	-	200	400	nC
Gate-Source Charge		Q_{gs}		-	135	-	
Gate-Drain ("Miller") Charge		Q_d		-	65	-	

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

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	-	-	-	45	A
Pulse Drain Reverse Current	I_{DRP}	-	-	-	180	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 45A, V_{GS} = 0V$	-	-	-2.0	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 45A, V_{GS} = 0V$	-	160	-	ns
Reverse Recovered Charge	Q_{rr}	$dI_{DR}/dt = 50A/\mu s$	-	0.2	-	μC

