

### Field Effect Transistor

Industrial Applications Unit in mm

### Silicon N Channel MOS Type ( $\tau$ -MOS III.5)

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

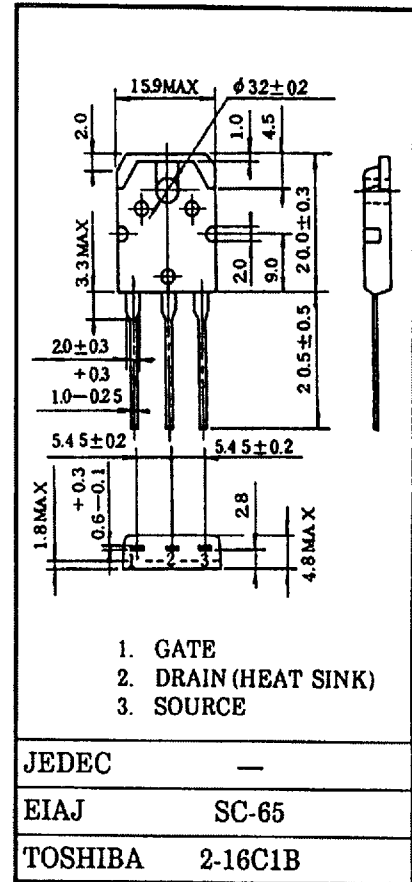
### Relay Drive and Motor Drive Applications

#### Features

- Low Drain-Source ON Resistance
  - $R_{DS(ON)} = 0.38\Omega$  (Typ.)
- High Forward Transfer Admittance
  - $|Y_{fs}| = 7.0S$  (Typ.)
- Low Leakage Current
  - $I_{DSS} = 300\mu A$  (Max.) @  $V_{DS} = 500V$
- Enhancement-Mode
  - $V_{th} = 2.0 \sim 4.0V$  @  $V_{DS} = 10V, I_D = 1mA$

#### Absolute Maximum Ratings ( $T_a = 25C$ )

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	$V_{DSS}$	500	V
Drain-Gate Voltage ( $R_{GS} = 20k\Omega$ )	$V_{DGR}$	500	V
Gate-Source Voltage	$V_{GSS}$	$\pm 30$	V
Drain Current	DC	$I_b$	15
	Pulse	$I_{bP}$	60
Drain Power Dissipation ( $T_c = 25^\circ C$ )	$P_D$	150	W
Channel Temperature	$T_{ch}$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55 - 150	$^\circ C$



Weight : 4.6g

#### Thermal Characteristics

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$\theta_{(ch-c)}$	0.833	$^\circ C/W$
Thermal Resistance, Channel to Ambient	$\theta_{(ch-a)}$	50	$^\circ C/W$

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

## Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		$I_{GSS}$	$V_{GS} = \pm 25V, V_{DS} = 0V$	-	-	$\pm 100$	nA
Drain Cut-off Current		$I_{DSS}$	$V_{DS} = 500V, V_{GS} = 0V$	-	-	300	$\mu A$
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10mA, V_{GS} = 0V$	500	-	-	V
Gate Threshold Voltage		$V_{th}$	$V_{DS} = 10V, I_D = 1mA$	2.0	-	4.0	V
Drain-Source ON Resistance		$r_{DS(ON)}$	$I_D = 7A, V_{GS} = 10V$	-	0.38	0.45	$\Omega$
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10V, I_D = 7A$	6.0	7.0	-	S
Input Capacitance		$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V,$ $f = 1MHz$	-	1480	2300	pF
Reverse Transfer Capacitance		$C_{rss}$		-	240	300	
Output Capacitance		$C_{oss}$		-	400	550	
Switching Time	Rise Time	$t_r$	<p><math>I_D = 7A</math> <math>V_{OUT}</math> <math>R_L = 30\Omega</math> <math>V_{DD} = 210V</math> <math>V_{IN} : t_r, t_f &lt; 5ns,</math> <math>Duty \leq 1\%, t_w = 10\mu s</math></p>	-	90	180	ns
	Turn-on Time	$t_{on}$		-	120	240	
	Fall Time	$t_f$		-	110	220	
	Turn-off Time	$t_{off}$		-	250	500	
Total Gate Charge (Gate-Source Plus Gate-Drain)		$Q_g$	$V_{DD} = 400V, V_{GS} = 10V,$ $I_D = 15A$	-	60	75	nC
Gate-Source Charge		$Q_{gs}$		-	25	-	
Gate-Drain ("Miller") Charge		$Q_{gd}$		-	35	-	

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

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	$I_{DR}$	-	-	-	15	A
Pulse Drain Reverse Current	$I_{DRP}$	-	-	-	60	A
Diode Forward Voltage	$V_{DSF}$	$I_{DR} = 15A, V_{GS} = 0V$	-	-	-1.7	V
Reverse Recovery Time	$t_{rr}$	$I_{DR} = 15A, V_{GS} = 0V$	-	750	-	ns
Reverse Recovered Charge	$Q_{rr}$	$dI_{DRP}/dt = 100A/\mu s$	-	5.6	-	$\mu C$

