



SEMICONDUCTOR

TECHNICAL DATA

TOSHIBA FIELD EFFECT TRANSISTOR

2 S K 6 9 3

SILICON N CHANNEL MOS TYPE

(π -MOS I)

INDUSTRIAL APPLICATIONS

Unit in mm

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR

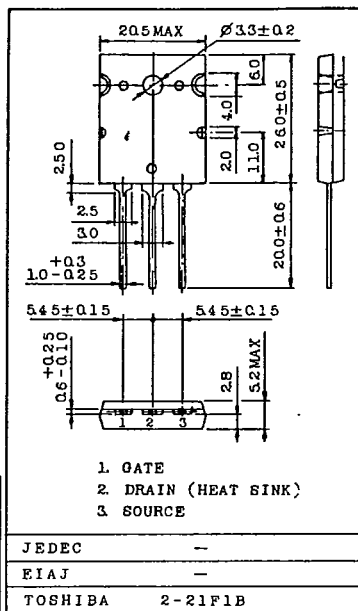
DRIVE APPLICATIONS.

FEATURES:

- Low Drain-Source ON Resistance : $R_{DS(ON)}=0.32\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}|=9.0S$ (Typ.)
- Low Leakage Current : $I_{GSS}=\pm 100nA$ (Max.) @ $V_{GS}=\pm 20V$
 $I_{DSS}=300\mu A$ (Max.) @ $V_{DS}=450V$
- Enhancement-Mode : $V_{th}=2.0\sim 4.0V$ @ $V_{DS}=10V, I_D=1mA$

MAXIMUM RATINGS ($T_a=25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSX}	450	V
Drain-Gate Voltage ($R_{GS}=20k\Omega$)		V_{DGR}	450	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC ($T_c=25^\circ C$)	I_D	13	A
	Pulse	I_{DP}	52	
Drain Power Dissipation ($T_c=25^\circ C$)		P_D	150	W
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55\sim 150$	$^\circ C$



Weight : 9.75g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.83	$^\circ C/W$
Thermal Resistance, Junction to Ambient	$R_{th(j-a)}$	30	$^\circ C/W$
Maximum Lead Temperature for Soldering Purposes (1.6mm from case for 10 seconds)	T_L	300	$^\circ C$

TOSHIBA CORPORATION



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}	$V_{DS}=450V$, $V_{GS}=0V$	-	-	300	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D=10mA$, $V_{GS}=0V$	450	-	-	V
Gate Threshold Voltage		V_{th}	$V_{DS}=10V$, $I_D=1mA$	2.0	-	4.0	V
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS}=10V$, $I_D=7A$	6.0	9.0	-	S
Drain-Source ON Resistance		$R_{DS(ON)}$	$I_D=7A$, $V_{GS}=10V$	-	0.32	0.40	Ω
Drain-Source ON Voltage		$V_{DS(ON)}$	$I_D=13A$, $V_{GS}=10V$	-	4.8	6.3	V
Input Capacitance		C_{iss}	$V_{DS}=10V$, $V_{GS}=0V$, $f=1MHz$	-	2300	3600	pF
Reverse Transfer Capacitance		C_{rss}		-	450	680	
Output Capacitance		C_{oss}		-	1000	1400	
Switching Time	Rise Time	t_r		-	70	140	ns
	Turn-on Time	t_{on}		-	100	200	
	Fall Time	t_f		-	75	150	
	Turn-off Time	t_{off}		-	350	700	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$I_D=13A$, $V_{GS}=10V$ $V_{DD}=360V$	-	82	110	nC
Gate-Source Charge		Q_{gs}		-	47	-	
Gate-Drain ("Miller") Charge		Q_{gd}		-	35	-	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	--	-	-	13	A
Pulse Drain Reverse Current	I_{DRP}	--	-	-	52	A
Diode Forward Voltage	V_{DSF}	$I_{DR}=13A$, $V_{GS}=0V$	-	-	1.8	V
Reverse Recovery Time	t_{rr}	$I_{DR}=13A$	-	400	-	ns
Reverse Recovered Charge	Q_{rr}	$dI_{DR}/dt=100A/\mu s$	-	4.0	-	μC