

TOSHIBA SEMICONDUCTOR

TECHNICAL DATA

TOSHIBA FIELD EFFECT TRANSISTOR

S 2 3 7 0

SILICON N CHANNEL MOS TYPE

(π -MOS I)

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.
CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR
DRIVE APPLICATIONS.

FEATURES:

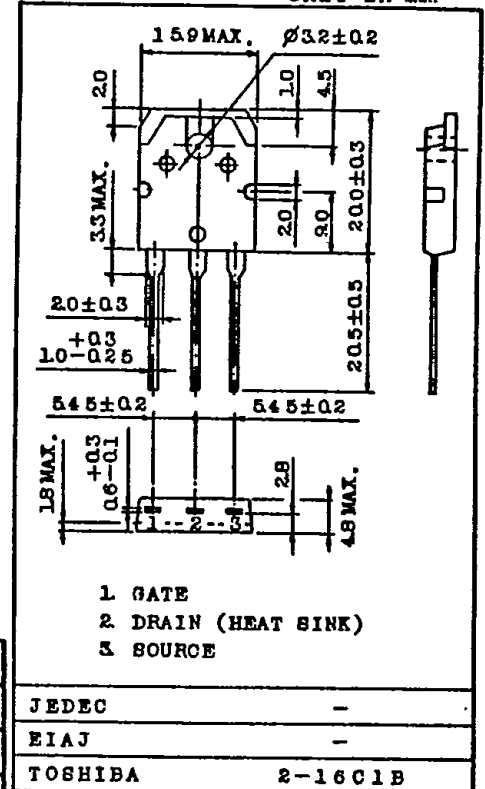
- Low Drain-Source ON Resistance : $R_{DS(ON)}=0.030\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}|=13S$ (Typ.)
- Low Leakage Current : $I_{GSS}=\pm 100nA$ (Max.) @ $V_{GS}=\pm 20V$
 $I_{DSS}=300\mu A$ (Max.) @ $V_{DS}=60V$
- Enhancement-Mode : $V_{th}=1.5\sim 3.5V$ @ $V_{DS}=10V, I_D=1mA$

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSX}	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	40	A
	Pulse	I_{DP}	160	
Drain Power Dissipation ($T_c=25^\circ C$)		P_D	125	W
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55\sim 150$	$^\circ C$

INDUSTRIAL APPLICATIONS

Unit in mm



THERMAL CHARACTERISTICS

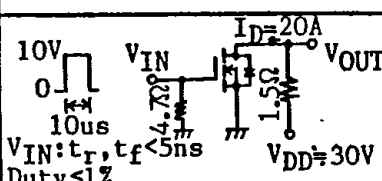
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	1.00	$^\circ C/W$
Thermal Resistance, Junction to Ambient	$R_{th(j-a)}$	50	$^\circ C/W$
Maximum Lead Temperature for Soldering Purposes (1.6mm from case for 10 seconds)	T_L	300	$^\circ C$

TOSHIBA SEMICONDUCTOR

TECHNICAL DATA

S 2 3 7 0

ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS=±20V, VDS=0V	-	-	±100	nA
Drain Cut-off Current		IDSS	VDS=60V, VGS=0V	-	-	300	µA
Drain-Source Breakdown Voltage		V(BR)DSS	ID=10mA, VGS=0V	60	-	-	V
Gate Threshold Voltage		Vth	VDS=10V, ID=1mA	1.5	-	3.5	V
Forward Transfer Admittance		Yfs	VDS=10V, ID=20A	9.0	13	-	S
Drain-Source ON Resistance		RDS(ON)	ID=20A, VGS=10V	-	0.030	0.045	Ω
Input Capacitance		Ciss	VDS=10V, VGS=0V, f=1MHz	-	2100	2700	pF
Reverse Transfer Capacitance		Crss		-		1000	
Output Capacitance		Coss		-	2000	2800	
Switching Time	Rise Time	tr		-	45		ns
	Turn-on Time	ton		-	65		
	Fall Time	tf		-	25		
	Turn-off Time	toff		-	80		
Total Gate charge (Gate-Source Plus Gate-Drain)		Qg	ID=40A, VGS=10V VDD=48V	-	65		nC
Gate-Source Charge		Qgs		-	35	-	
Gate-Drain ("Miller") Charge		Qgd		-	30	-	

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

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	--	-	-	40	A
Rulse Drain Reverse Current	IDRP	--	-	-	160	A
Diode Foward Voltage	VDSF	IDR=40A, VGS=0V	-	-	1.8	V
Reverse Recovery Time	trr	IDR=40A	-	150	-	ns
Reverse Recovered Charge	Qrr	dIDR/dt=50A/us	-	0.35	-	µC