

T 39-13

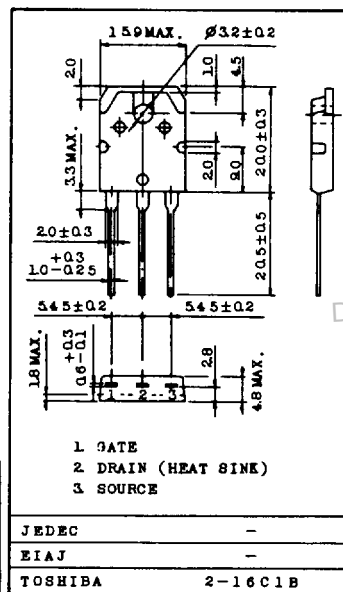
HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.  
CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR  
DRIVE APPLICATIONS.

## FEATURES:

- Low Drain-Source ON Resistance :  $R_{DS(ON)}=0.045\Omega$ (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}|=11S$  (Typ.)
- Low Leakage Current :  $I_{GSS}=\pm 100nA$ (Max.) @  $V_{GS}=\pm 20V$   
 $I_{DSS}=250\mu A$  (Max.) @  $V_{DS}=100V$
- Enhancement-Mode :  $V_{th}=2.0\sim 4.0V$  @  $V_{DS}=V_{GS}, I_D=250\mu A$

## INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 4.6g

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	$V_{DSX}$	100	V
Drain-Gate Voltage ( $R_{GS}=20k\Omega$ )	$V_{DGR}$	100	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	40
	Pulse	$I_{DP}$	160
Drain Power Dissipation ( $T_c=25^\circ C$ )	$P_D$	150	W
Channel Temperature	$T_{ch}$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	$-55\sim 150$	$^\circ C$

## 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	$^\circ C$

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## 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=100V, VGS=0V	-	-	250	µA
Drain-Source Breakdown Voltage		V(BR)DSS	ID=250µA, VGS=0V	100	-	-	V
Gate Threshold Voltage		Vth	VDS=10V, ID=250µA	2.0	-	4.0	V
Forward Transfer Admittance		Yfs	VDS=10V, ID=20A	9	11	-	S
Drain-Source ON Resistance		RDS(ON)	ID=20A, VGS=10V	-	0.045	0.055	Ω
Input Capacitance		Ciss	VDS=25V, VGS=0V, f=1MHz	-	1700	3000	pF
Reverse Transfer Capacitance		Crss		-	180	500	
Output Capacitance		Coss		-	850	1500	
Switching Time	Rise Time	tr		-	50	100	ns
	Turn-on Time	ton		-	65	135	
	Fall Time	tf		-	50	100	
	Turn-off Time	toff		-	110	225	
Total Gate charge (Gate-Source Plus Gate-Drain)		Qg	ID=10V, VGS=40A VDD=48V	-	57	114	nC
Gate-Source Charge		Qgs		-	33	-	
Gate-Drain ("Miller") Charge		Qgd		-	24	-	

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

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	--	-	-	40	A
Pulse Drain Reverse Current	IDRP	--	-	-	40	A
Diode Forward Voltage	VDSF	IDR=40A, VGS=0V	-	-	2.5	V
Reverse Recovery Time	trr	IDR=40A	-	600	-	ns
Reverse Recovered Charge	Qrr	dIDR/dt=100A/us	-	3.3	-	µC