T 32-13

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

FEATURES:

- Low Drain-Source ON Resistance : $R_{DS(ON)}=0.3\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}|=11S$ (Typ.)
- Low Leakage Current : $I_{GSS}=\pm500nA$(Max.) @ $V_{GS}=\pm20V$
  $I_{DSS}=250\mu A$ (Max.) @ $V_{DS}=500V$
- Enhancement-Mode : $V_{th}=2.0\sim4.0V$ @ $V_{DS}=V_{GS}, I_D=250\mu A$

INDUSTRIAL APPLICATIONS
Unit in mm

1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

JEDEC	—
EIAJ	—
TOSHIBA	2-16C1B
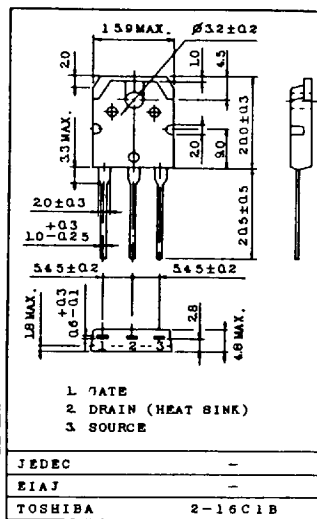
Weight : 4.6g

MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSX}	500	V
Drain-Gate Voltage ($R_{GS}=20k\Omega$)		V_{DGR}	500	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	DC	I_D	13	A
	Pulse	I_{DP}	52	
Drain Power Dissipation (Tc=25°C)		P_D	150	W
Channel Temperature		Tch	150	°C
Storage Temperature Range		T_{stg}	−55∼150	°C

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.83	°C/W
Thermal Resistance, Junction to Ambient	$R_{th(j-a)}$	50	°C/W
Maximum Lead Temperature for Soldering Purposes (1.6mm from case for 10 seconds)	T_L	300	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS}=\pm20V$, $V_{DS}=0V$	–	–	±500	nA
Drain Cut-off Current		I_{DSS}	$V_{DS}=500V$, $V_{GS}=0V$	–	–	250	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D=250\mu A$, $V_{GS}=0V$	500	–	–	V
Gate Threshold Voltage		V_{th}	$V_{DS}=V_{GS}$, $I_D=250\mu A$	2.0	–	4.0	V
Forward Transfer Admittance		$|Y_{fs}|$	$V_{DS}=10V$, $I_D=7A$	6.0	11	–	S
Drain-Source ON Resistance		$R_{DS(ON)}$	$I_D=7A$, $V_{GS}=10V$	–	0.3	0.4	Ω
Drain-Source ON Voltage		$V_{DS(ON)}$	$I_D=13A$, $V_{GS}=10V$	–	4.3	6.3	V
Input Capacitance		C_{iss}		–	2000	3000	
Reverse Transfer Capacitance		C_{rss}	$V_{DS}=25V$, $V_{GS}=0V$, f=1MHz	–	100	200	pF
Output Capacitance		C_{oss}		–	370	600	
Switching Time	Rise Time	t_r	$I_D=7A$, V_{OUT}, V_{IN}, 10V, 0, 10us, $V_{IN}:t_r,t_f<5ns$, Duty≤1%, $V_{DD}=210V$	–	25	50	ns
	Turn-on Time	t_{on}		–	40	85	
	Fall Time	t_f		–	35	70	
	Turn-off Time	t_{off}		–	110	220	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$I_D=16A$, $V_{GS}=10V$ $V_{DD}=400V$	–	82	120	nC
Gate-Source Charge		Q_{gs}		–	40	–	
Gate-Drain ("Miller") Charge		Q_{gd}		–	42	–	

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}	$I_{DR}=13A$, $V_{GS}=0V$	–	–	1.4	V
Reverse Recovery Time	t_{rr}	$I_{DR}=13A$	–	1300	–	ns
Reverse Recovered Charge	Q_{rr}	$dI_{DR}/dt=100A/\mu s$	–	7.4	–	μC