

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE (U-MOSII)

TPC8103

LITHIUM ION BATTERY

PORTABLE MACHINES AND TOOLS

NOTE BOOK PC

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 9.5m\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 20S$ (Typ.)
- Low Leakage Current
: $I_{DSS} = -10\mu A$ (Max.) ($V_{DS} = -30V$)
- Enhancement-Mode
: $V_{th} = -0.8 \sim -2.0V$ ($V_{DS} = -10V$, $I_D = -1mA$)

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	-30	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)		V_{DGR}	-30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC	I_D	-11	A
	Pulse	I_{DP}	-44	A
Drain Power Dissipation ($t = 10s$)		P_D^{***}	2.4	W
Single Pulse Avalanche Energy**		E_{AS}	157	mJ
Avalanche Current		I_{AR}	11	A
Repetitive Avalanche Energy*		E_{AR}	0.24	mJ
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	-55~150	$^\circ C$

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	52.1	$^\circ C/W$

Note ;

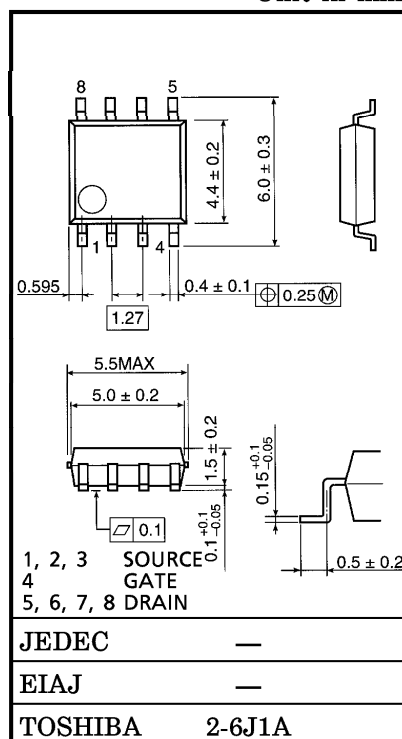
* Repetitive rating ; Pulse Width Limited by Max. Junction temperature.

** $V_{DD} = -24V$, Starting $T_{ch} = 25^\circ C$, $L = 1.0mH$, $R_G = 25\Omega$, $I_{AR} = -11A$ *** Drive operation : Mount on glass epoxy board [$1inch^2 \times 0.8t$]

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

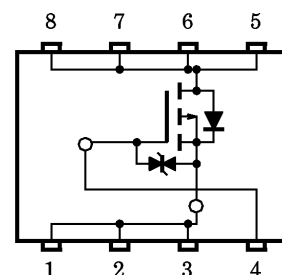
INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 0.08g (Typ.)

CIRCUIT CONFIGURATION



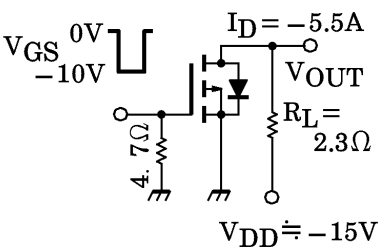
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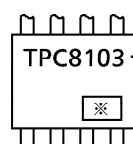
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16V, V_{DS} = 0V$	—	—	± 10	μA
Drain Cut-Off Current		I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$	—	—	-10	μA
Drain-Source Breakdown Voltage		$V_{(BR) DSS}$	$I_D = -10mA, V_{GS} = 0V$	-30	—	—	V
		$V_{(BR) DSX}$	$I_D = -10mA, V_{GS} = 20V$	-15	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = -10V, I_D = -1mA$	-0.8	—	-2.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = -4V, I_D = -5.5A$	—	18.5	23	$m\Omega$
		$R_{DS(ON)}$	$V_{GS} = -10V, I_D = -5.5A$	—	9.5	13	$m\Omega$
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = -10V, I_D = -5.5A$	10	20	—	S
Input Capacitance		C_{iss}	$V_{DS} = -10V, V_{GS} = 0V,$ $f = 1MHz$	—	2700	—	pF
Reverse Transfer Capacitance		C_{rss}		—	600	—	
Output Capacitance		C_{oss}		—	1000	—	
Switching Time	Rise Time	t_r	 $V_{GS} = 0V, -10V$ $I_D = -5.5A$ V_{OUT} $R_L = 2.3\Omega$ $V_{DD} = -15V$ $V_{IN} : t_r, t_f < 5ns$ $Duty \leq 1\%, t_w = 10\mu s$	—	50	—	ns
	Turn-On Time	t_{on}		—	60	—	
	Fall Time	t_f		—	220	—	
	Turn-Off Time	t_{off}		—	480	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = -24V, V_{GS} = -11V$ $I_D = -11A$	—	60	—	nC
Gate-Source Charge		Q_{gs}		—	40	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	20	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	-11	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	-44	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = -11A, V_{GS} = 0V$	—	—	1.2	V

MARKING



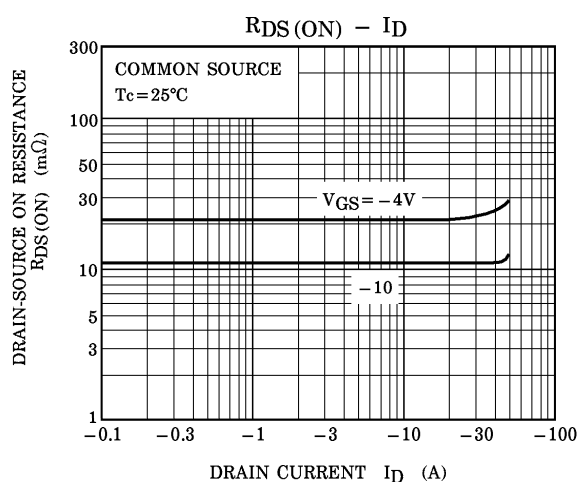
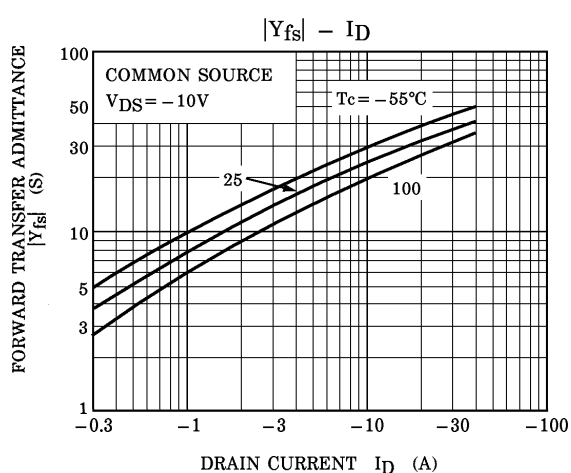
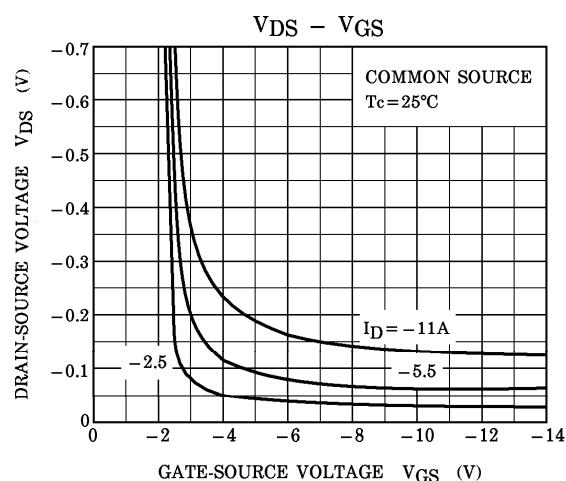
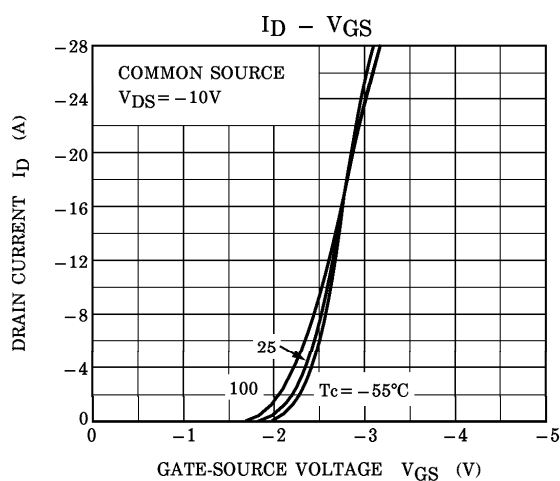
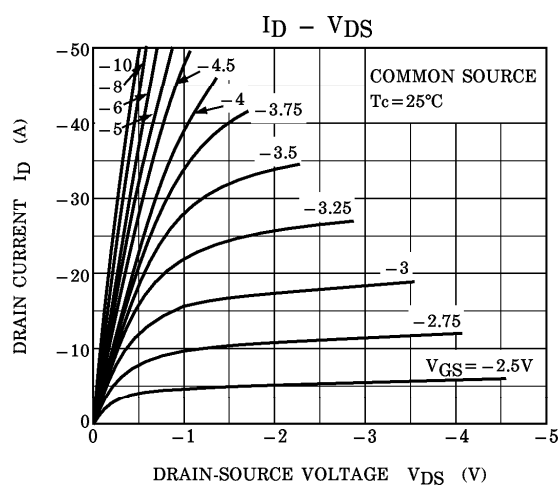
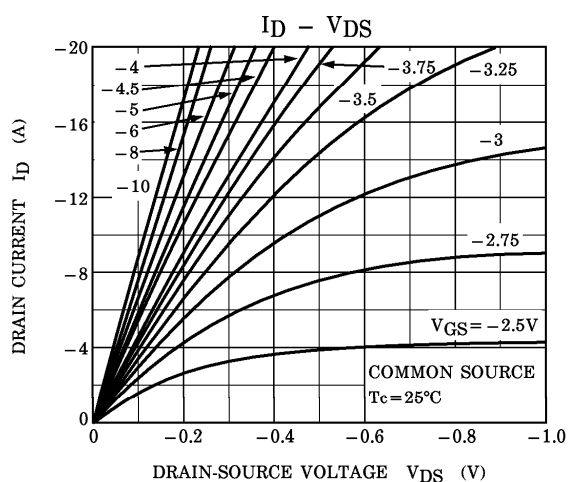
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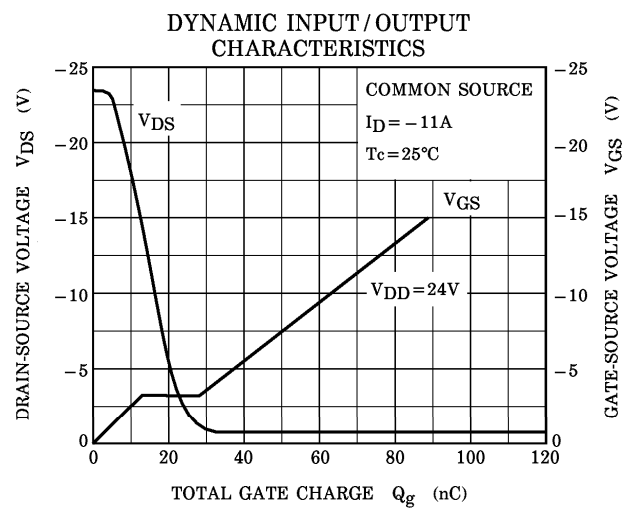
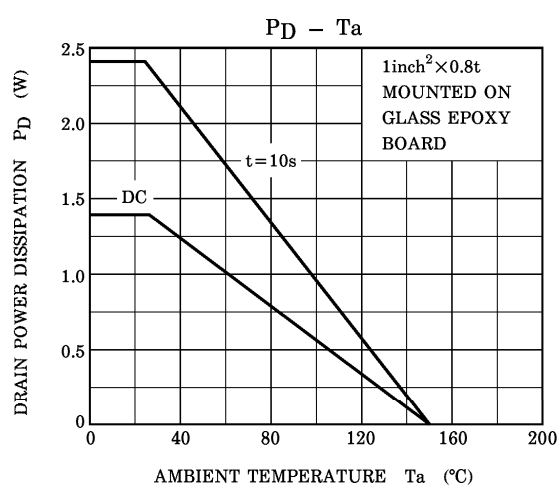
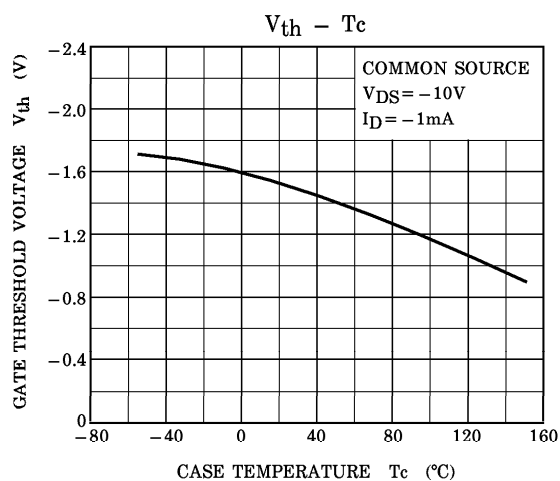
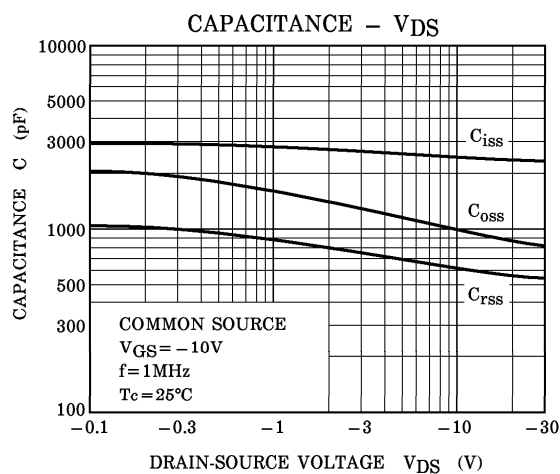
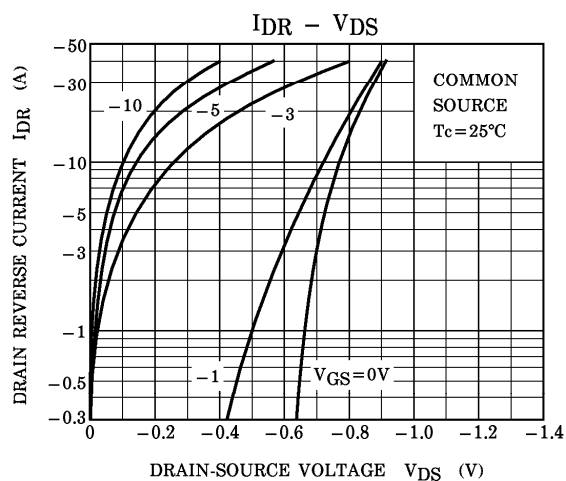
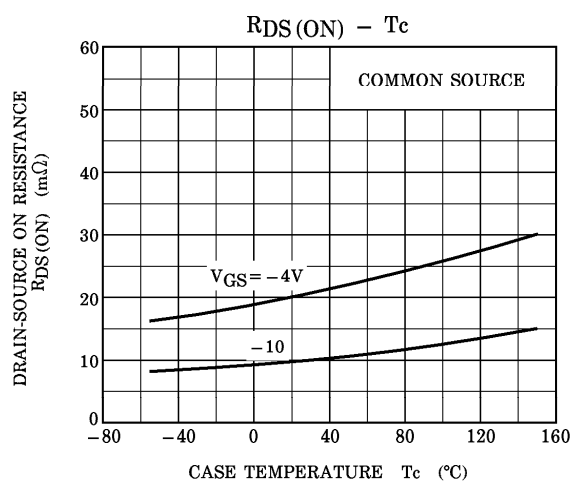
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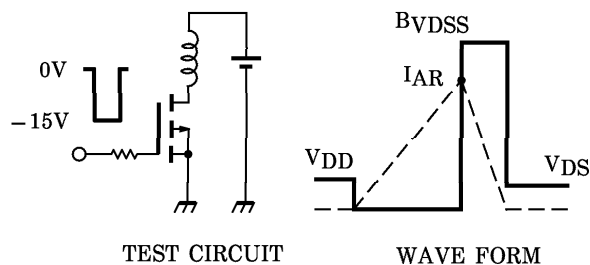
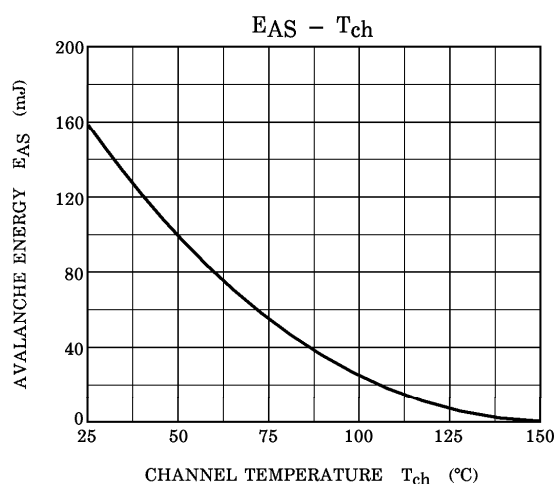
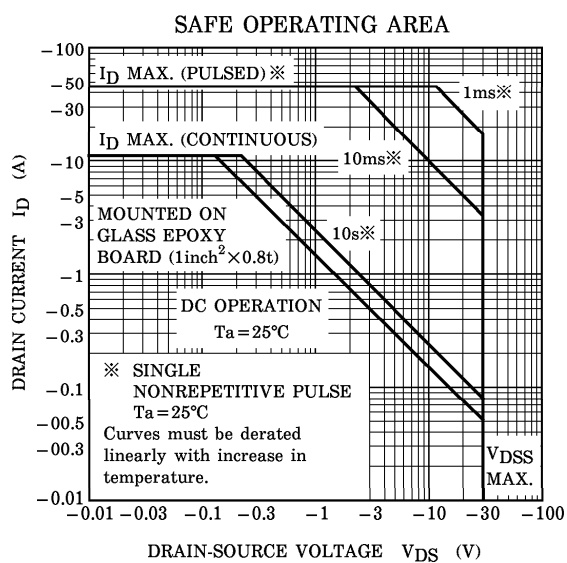
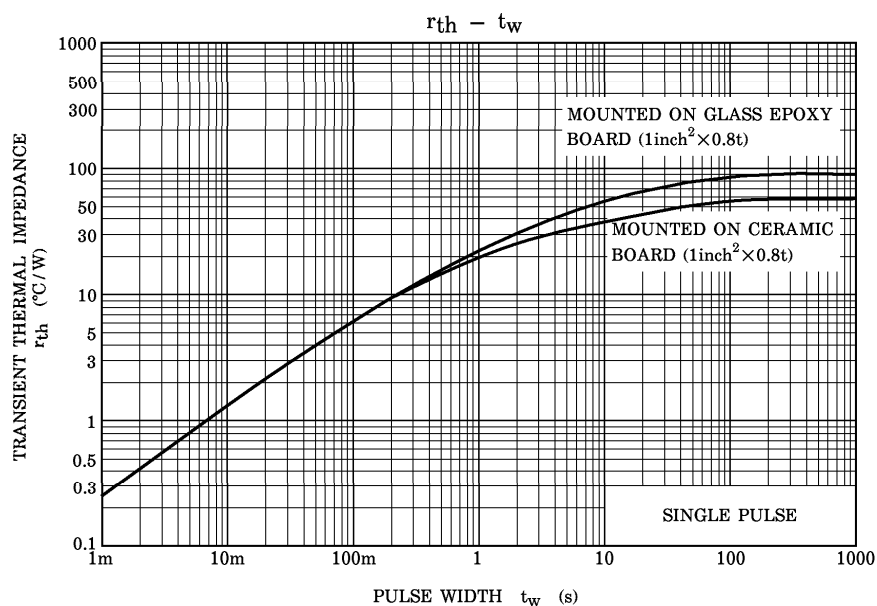


Month (Starting from Alphabet A)

Year (Last Number of the Christian Era)







Peak $I_{AR} = -11A$, $R_G = 25\Omega$
 $V_{DD} = -24V$, $L = 1.0mH$

$$E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{V_{DS}}}{B_{V_{DS}} - V_{DD}} \right)$$