

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (π -MOS π)

TPC8001

LITHIUM ION BATTERY
PORTABLE MACHINES AND TOOLS
NOTE BOOK PC

- Low Drain-Source ON Resistance : $R_{DS(ON)}=15m\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}|=11S$ (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 (Ta = 25°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	7	A
	Pulse	I_{DP}	28	A
Drain Power Dissipation (t=10s)		P_D^{***}	2.4	W
Single Pulse Avalanche Energy**		E_{AS}	64	mJ
Avalanche Current		I_{AR}	7	A
Repetitive Avalanche Energy*		E_{AR}	0.24	mJ
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	-55~150	°C

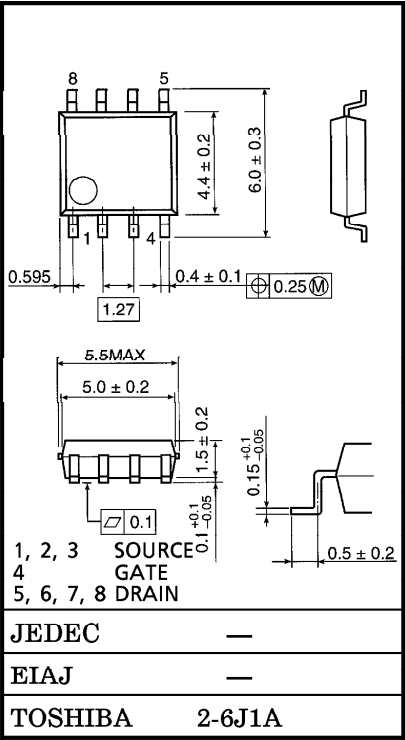
THERMAL CHARACTERISTICS

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

- Note ;
- * Repetitive rating ; Pulse Width Limited by Max. Junction temperature.
 - ** $V_{DD}=24V$, $T_{ch}=25^\circ C$, $L=1.0mH$, $I_{AR}=7A$
 - *** Drive operation : Mount on glass epoxy board [1inch²×0.8t]

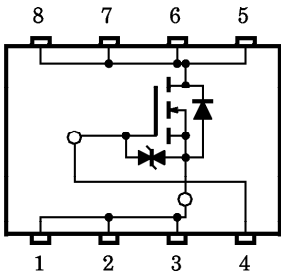
This transistor is an electrostatic sensitive device. Please handle with caution.

INDUSTRIAL APPLICATIONS
Unit in mm



Weight : 0.08g

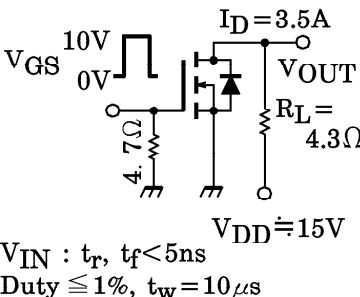
CIRCUIT CONFIGURATION



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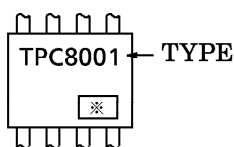
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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
Gate Threshold Voltage		V_{th}	$V_{DS} = 10V, I_D = 1mA$	0.8	—	2.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 4V, I_D = 3.5A$	—	25	30	$m\Omega$
		$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 3.5A$	—	16	20	$m\Omega$
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10V, I_D = 3.5A$	5.5	11	—	S
Input Capacitance		C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$	—	1250	—	pF
Reverse Transfer Capacitance		C_{rss}		—	190	—	
Output Capacitance		C_{oss}		—	760	—	
Switching Time	Rise Time	t_r	 $V_{IN} : t_r, t_f < 5ns$ Duty $\leq 1\%$, $t_w = 10\mu s$	—	9	—	ns
	Turn-On Time	t_{on}		—	17	—	
	Fall Time	t_f		—	24	—	
	Turn-Off Time	t_{off}		—	100	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \approx 24V, V_{GS} = 10V$ $I_D = 7A$	—	40	—	nC
Gate-Source Charge		Q_{gs}		—	27	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	13	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	7	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	28	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 7A, V_{GS} = 0V$	—	—	-1.2	V

MARKING

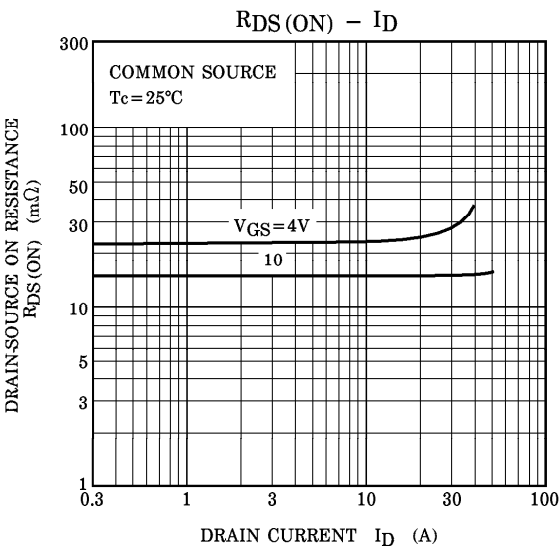
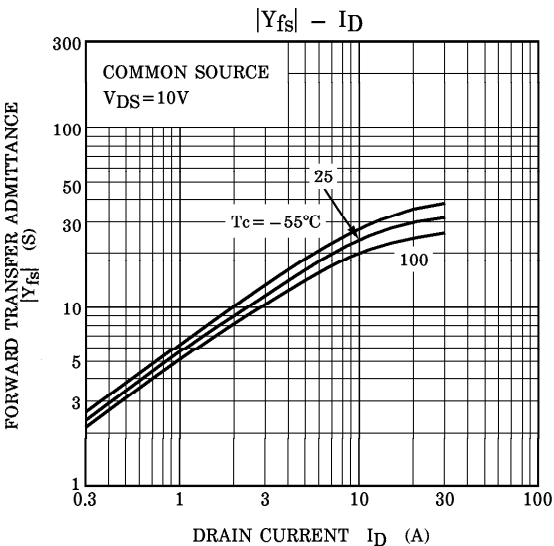
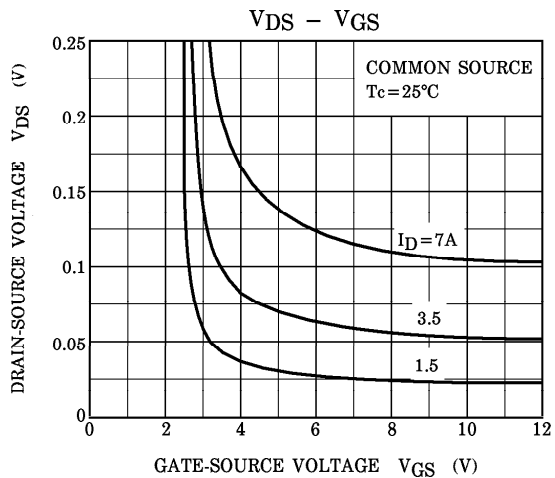
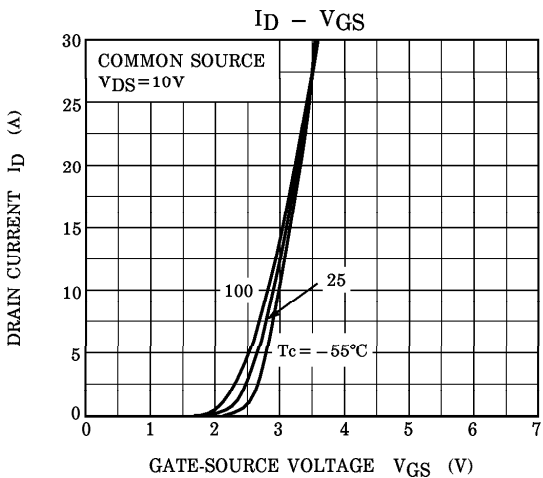
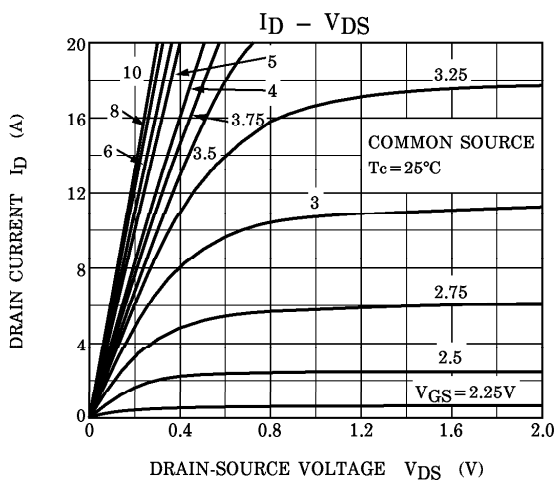
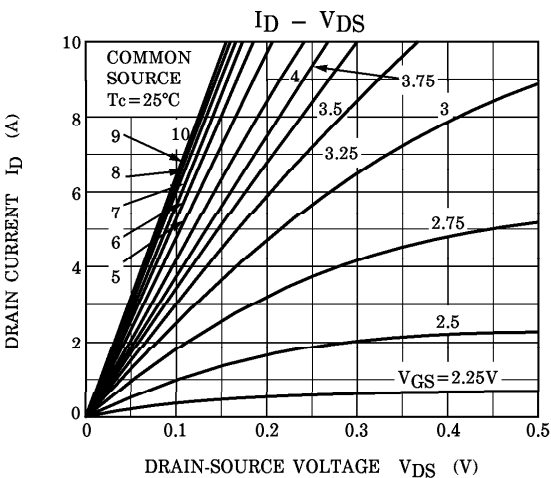


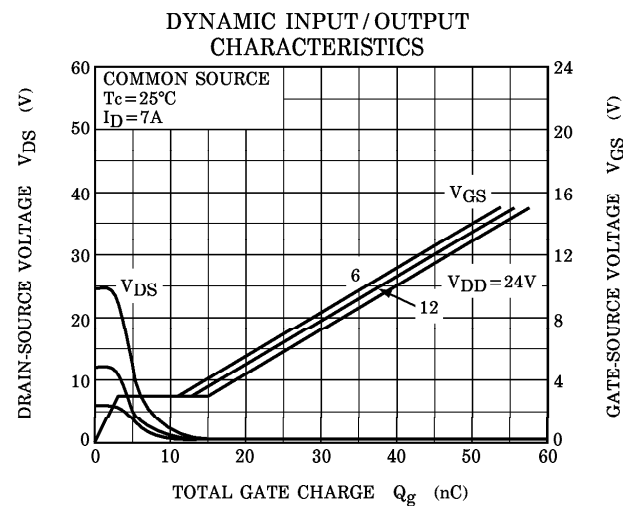
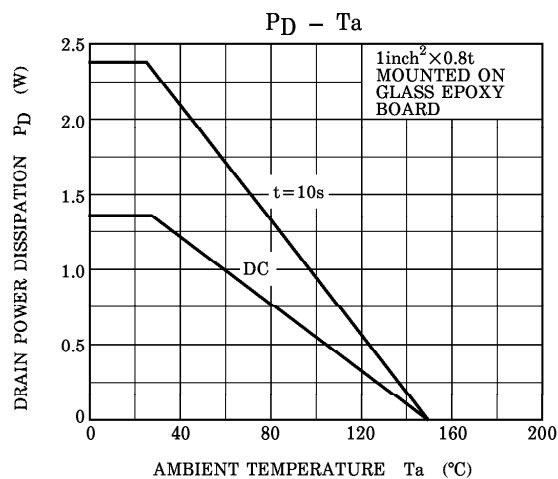
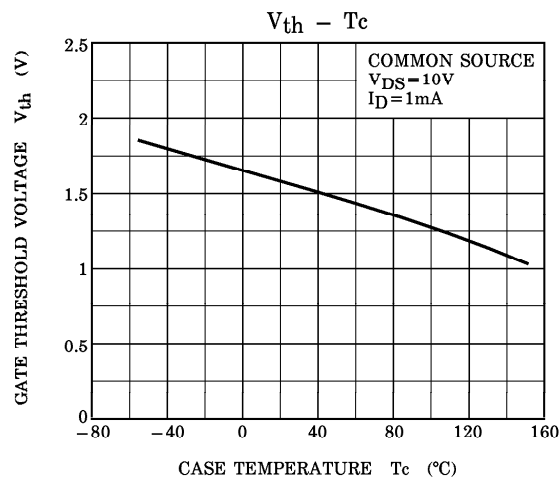
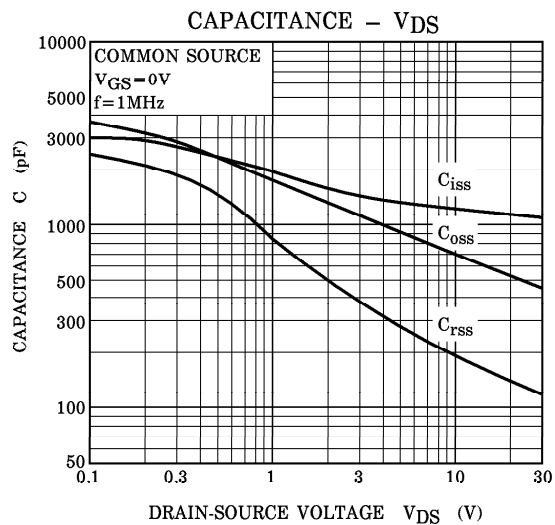
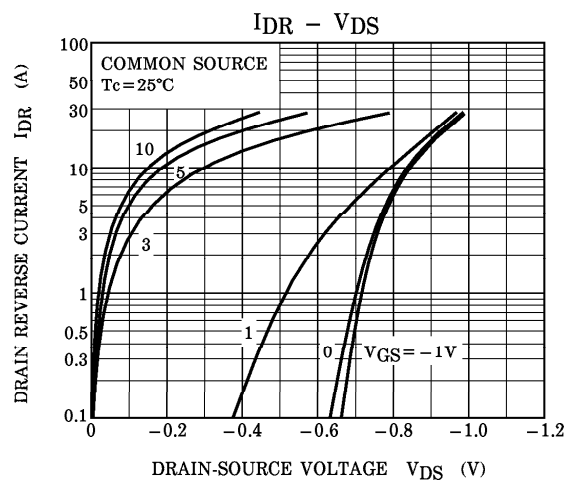
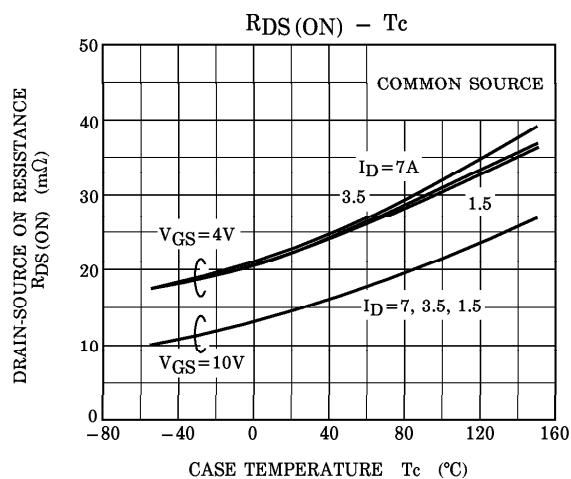
※ Lot Number

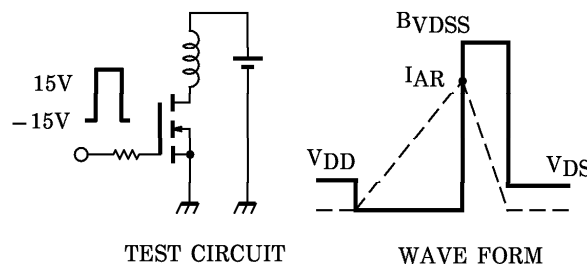
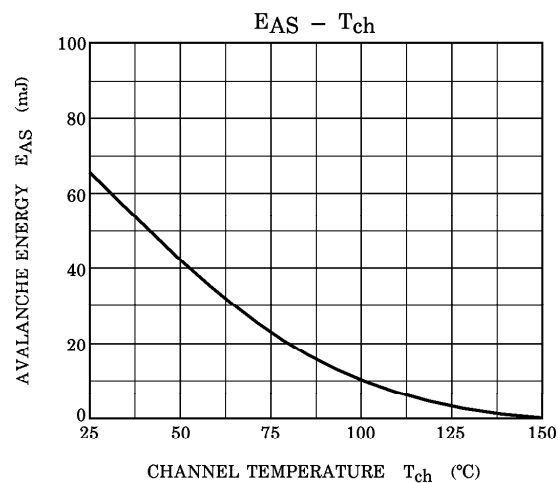
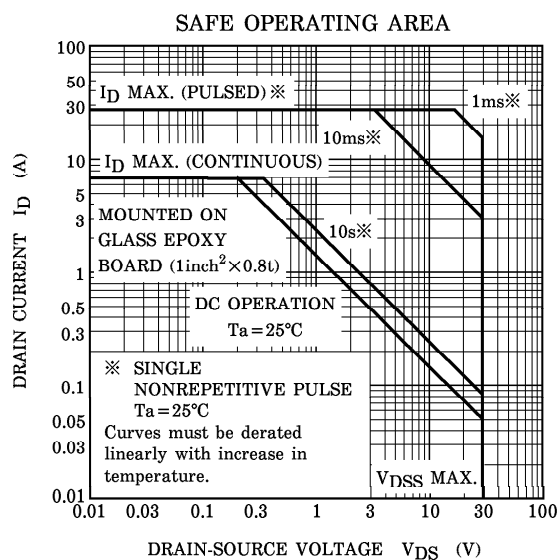
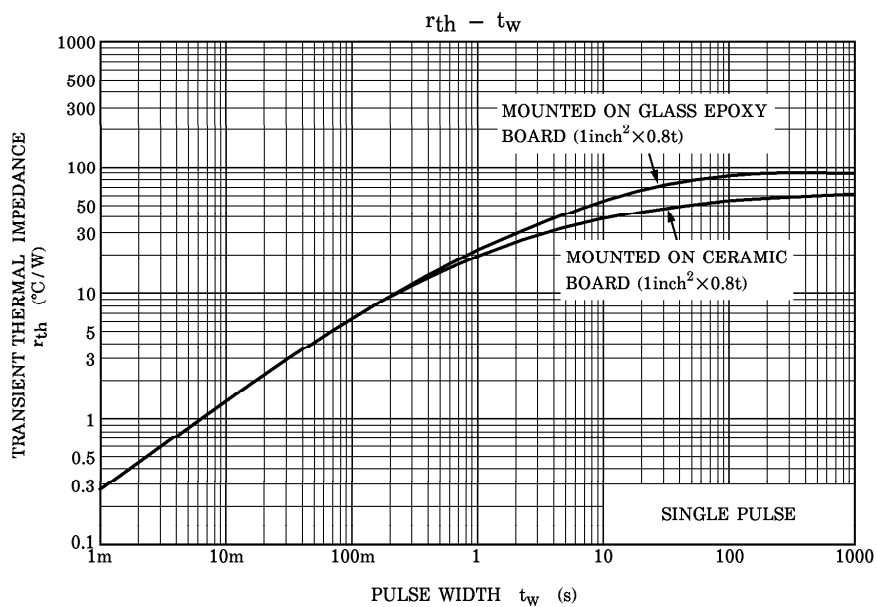


— Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 7A$, $R_G = 25\Omega$
 $V_{DD} = 24V$, $L = 1.0mH$

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