

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

TPC8002

LITHIUM ION BATTERY
PORTABLE MACHINES AND TOOLS
NOTE BOOK PC

- Low Drain-Source ON Resistance : $R_{DS(ON)}=11.5m\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}|=15S$ (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	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	°C
Storage Temperature Range		T_{stg}	$-55\sim 150$	°C

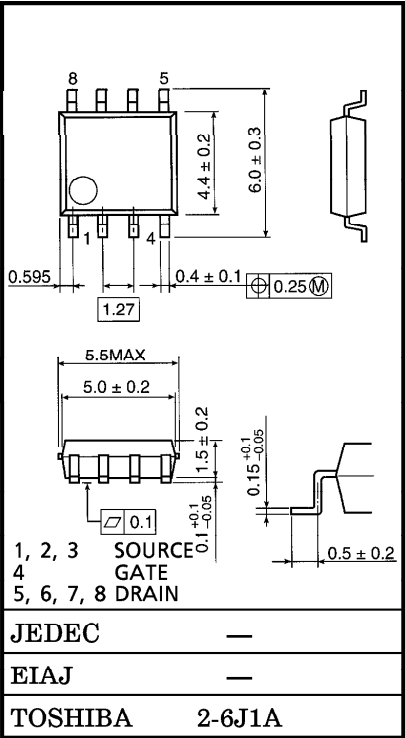
THERMAL CHARACTERISTICS

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.
 - ** $V_{DD}=24V$, $T_{ch}=25^\circ C$, $L=1.0mH$, $I_{AR}=11A$
 - *** Drive operation : Mount on glass epoxy board [1inch²×0.8t]

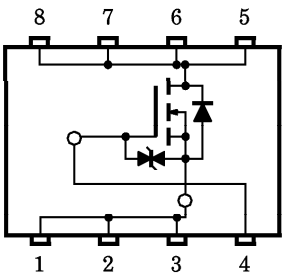
This transistor is an electrostatic sensitive device. Please handle with caution.

INDUSTRIAL APPLICATIONS
Unit in mm



Weight : 0.08g

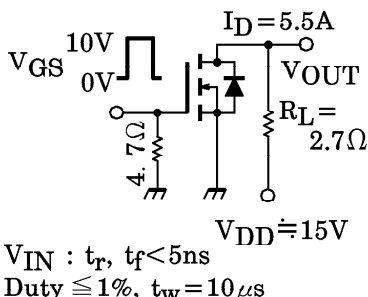
CIRCUIT CONFIGURATION



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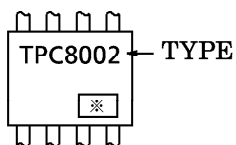
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GSS}	V _{GS} =±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 =5.5A	—	19	22	mΩ
		R _{DS (ON)}	V _{GS} =10V, I _D =5.5A	—	12	14	mΩ
Forward Transfer Admittance		Y _{fs}	V _{DS} =10V, I _D =5.5A	7.5	15	—	S
Input Capacitance		C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHz	—	1425	—	pF
Reverse Transfer Capacitance		C _{rss}		—	200	—	
Output Capacitance		C _{oss}		—	790	—	
Switching Time	Rise Time	t _r		—	11	—	ns
	Turn-On Time	t _{on}		—	19	—	
	Fall Time	t _f		—	25	—	
	Turn-Off Time	t _{off}		—	100	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q _g	V _{DD} ≐24V, V _{GS} =10V I _D =11A	—	44	—	nC
Gate-Source Charge		Q _{gs}		—	29	—	
Gate-Drain (“Miller”) Charge		Q _{gd}		—	15	—	

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

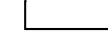
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	11	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	44	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 11A, V_{GS} = 0V$	—	—	−1.2	V

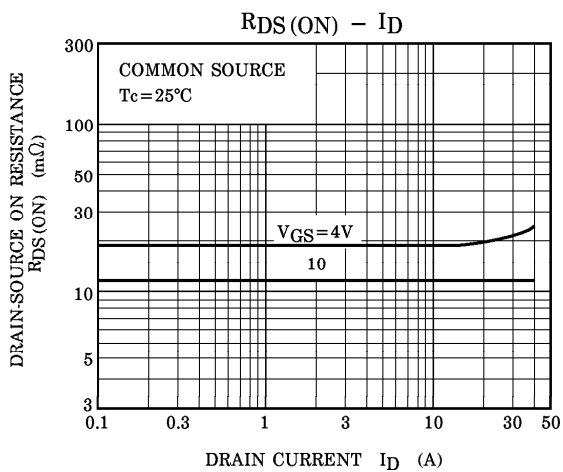
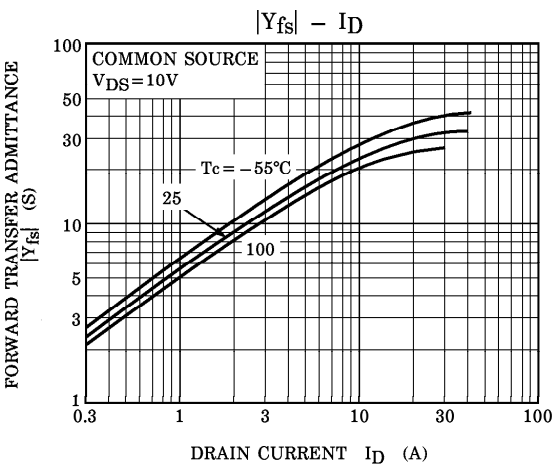
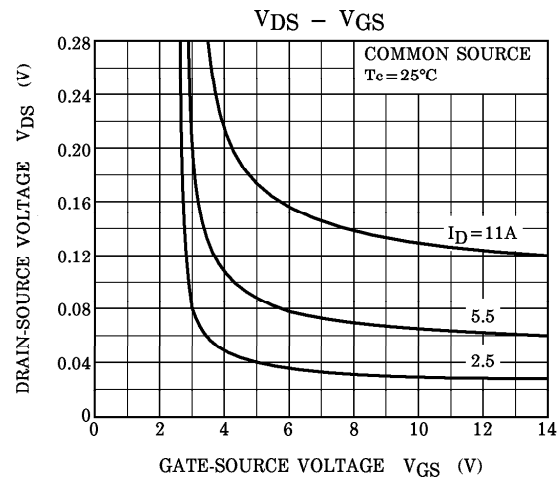
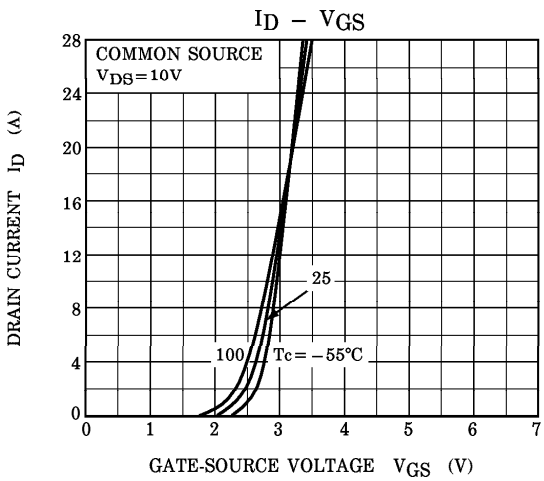
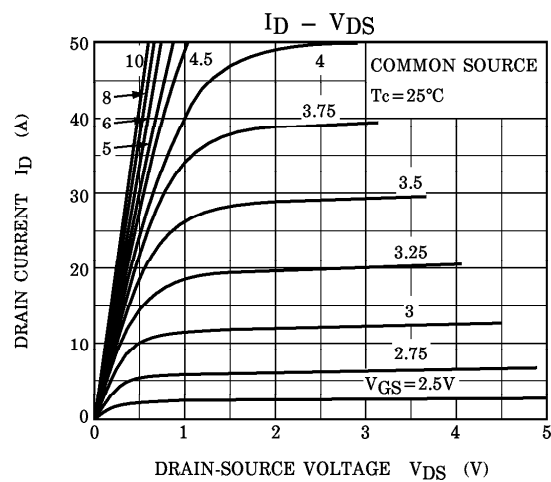
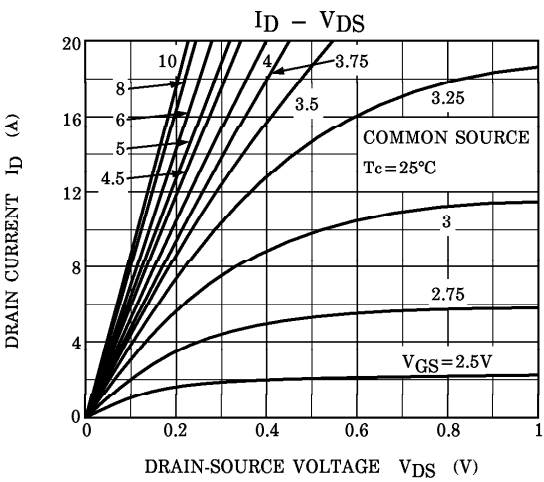
MARKING

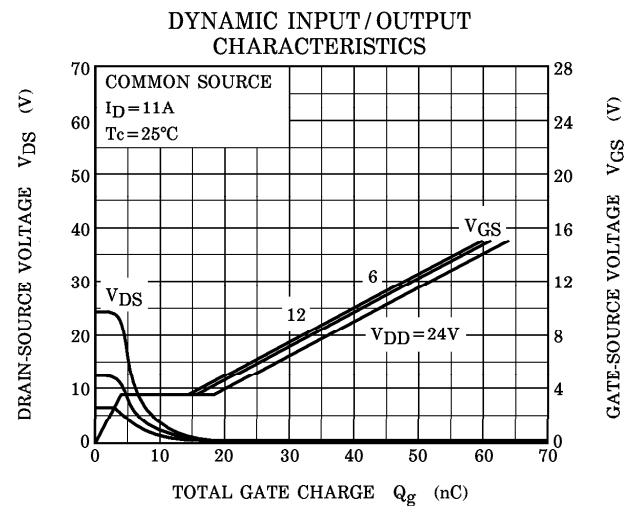
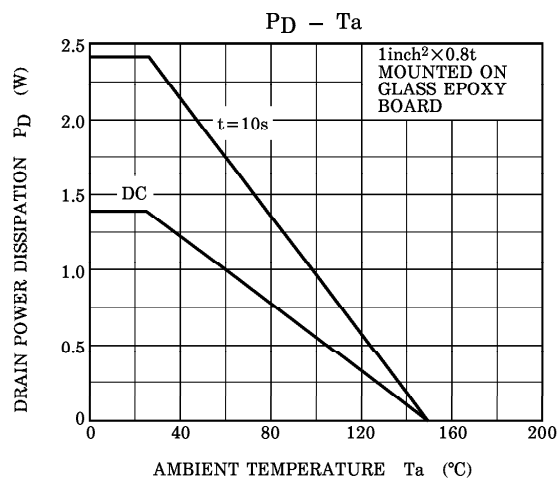
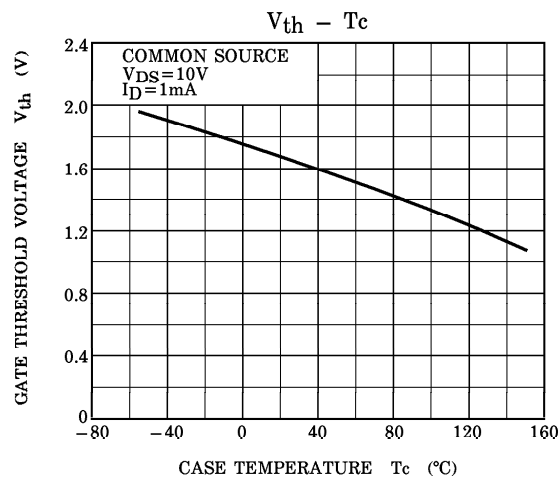
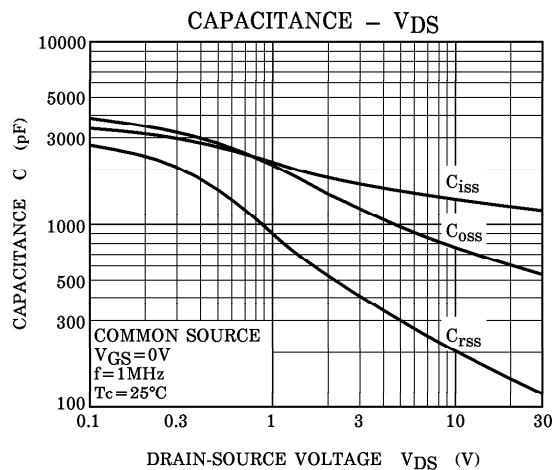
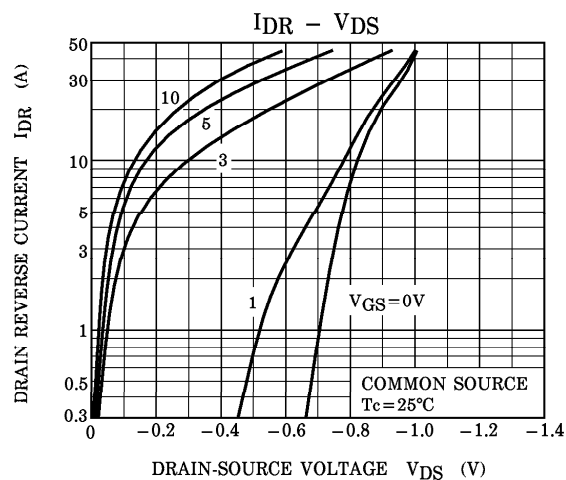
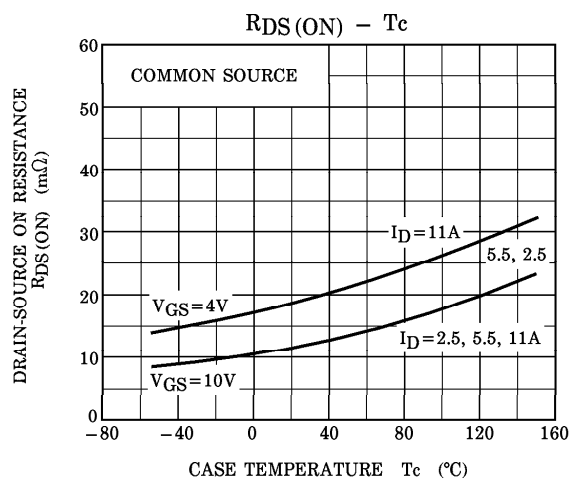


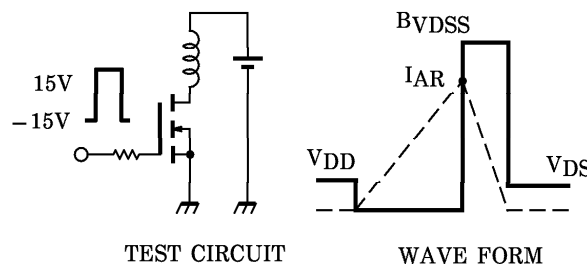
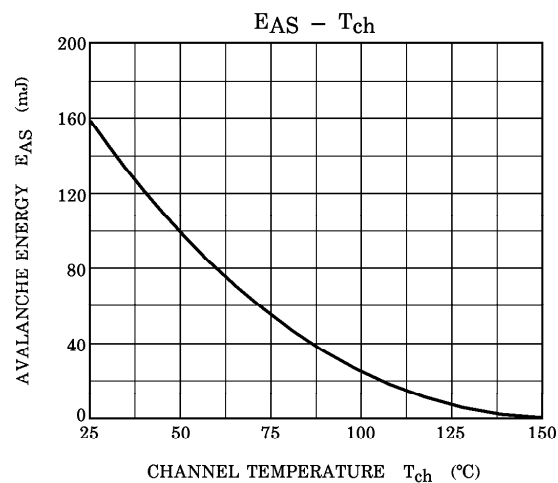
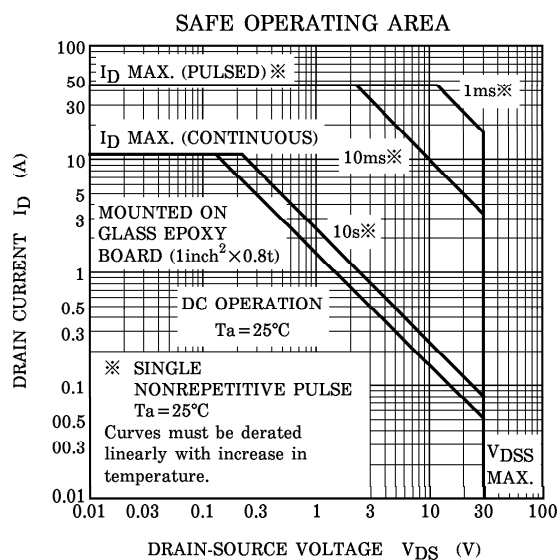
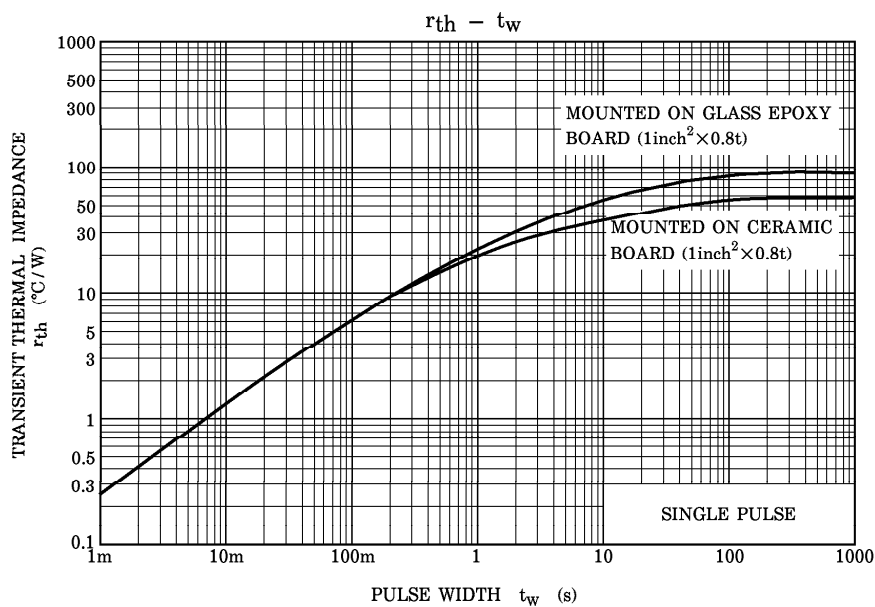
※ Lot Number

 — Month (Starting from Alphabet A)

 — Year (Last Number of the Christian Era)







Peak $I_{AR} = 11A$, $R_G = 25\Omega$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - V_{DD}} \right)$
 $V_{DD} = 24V$, $L = 1.0mH$