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

TPC8203

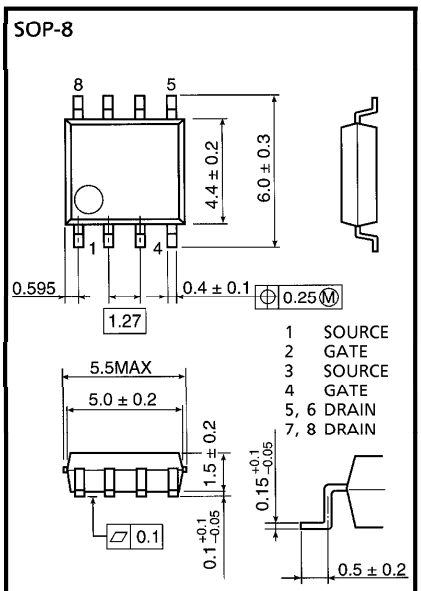
LITHIUM ION BATTERY APPLICATIONS

NOTE BOOK PC, PORTABLE EQUIPMENTS APPLICATIONS

INDUSTRIAL APPLICATIONS

- Low Drain-Source ON Resistance : $R_{DS\,(ON)} = 14\,m\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 8\,S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 10\,\mu A$ (Max.) ($V_{DS} = 30\,V$)
- Enhancement-Mode : $V_{th} = 0.8 \sim 2.5\,V$ ($V_{DS} = 10\,V$, $I_D = 1\,mA$)

Unit in mm



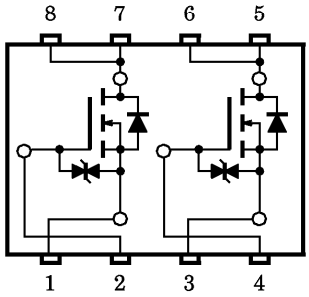
JEDEC	—
EIAJ	—
TOSHIBA	2-6J1A

Weight : 0.08 g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Drain-Gate Voltage ($R_{GS} = 20\,k\Omega$)		V_{DGR}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	DC	I_D	6	A
	Pulse	I_{DP}	24	A
Drain Power Dissipation*** (Ta = 25°C)		P_D	2.0	W
Single Pulse Avalanche Energy**		E_{AS}	46.8	mJ
Avalanche Current		I_{AR}	6	A
Repetitive Avalanche Energy*		E_{AR}	0.2	mJ
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	−55~150	°C

CIRCUIT CONFIGURATION



THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient***	$R_{th\,(ch\text{-}a)}$	62.5	°C / W

Note ;

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

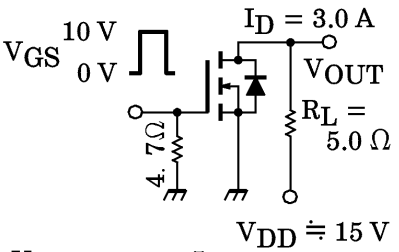
** $V_{DD} = 24\,V$, $T_{ch} = 25°C$ (initial), $L = 1.0\,mH$, $R_G = 25\,\Omega$, $I_{AR} = 6.0\,A$

*** Drive operation ; Mount on glass epoxy board [1 inch^2 × 0.8 t] in the two devices driving (t = 10 s)

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

961001EAA1

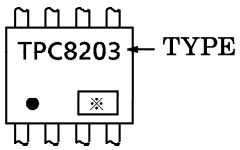
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	V_{GS} = ±16 V, V_{DS} = 0 V	—	—	±10	μA
Drain Cut-Off Current		I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V	—	—	10	μA
Drain-Source Breakdown Voltage		$V_{(BR)\ DSS}$	I_D = 10 mA, V_{GS} = 0 V	30	—	—	V
		$V_{(BR)\ DSX}$	I_D = 10 mA, V_{GS} = −20 V	15	—	—	
Gate Threshold Voltage		V_{th}	V_{DS} = 10 V, I_D = 1 mA	0.8	—	2.5	V
Drain-Source ON Resistance		$R_{DS\ (ON)}$	V_{GS} = 4 V, I_D = 3 A	—	21	32	mΩ
		$R_{DS\ (ON)}$	V_{GS} = 10 V, I_D = 3 A	—	14	21	mΩ
Forward Transfer Admittance		$\|Y_{fs}\|$	V_{DS} = 10 V, I_D = 3 A	4	8	—	S
Input Capacitance		C_{iss}	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz	—	1700	—	pF
Reverse Transfer Capacitance		C_{rss}		—	260	—	
Output Capacitance		C_{oss}		—	380	—	
Switching Time	Rise Time	t_r		—	10	—	ns
	Turn-On Time	t_{on}		—	20	—	
	Fall Time	t_f		—	35	—	
	Turn-Off Time	t_{off}		—	120	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	V_{DD} ≒ 24 V, V_{GS} = 10 V, I_D = 6 A	—	40	—	nC
Gate-Source Charge		Q_{gs}		—	28	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	12	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	6	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	24	A
Diode Forward Voltage	V_{DSF}	I_{DR} = 6 A, V_{GS} = 0 V	—	—	−1.2	V

MARKING

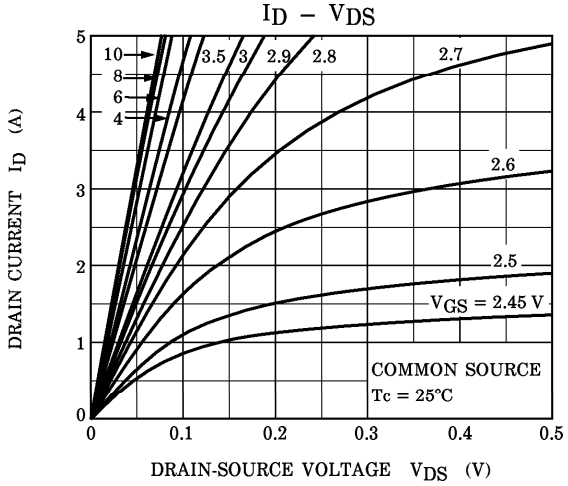


※ Lot Number

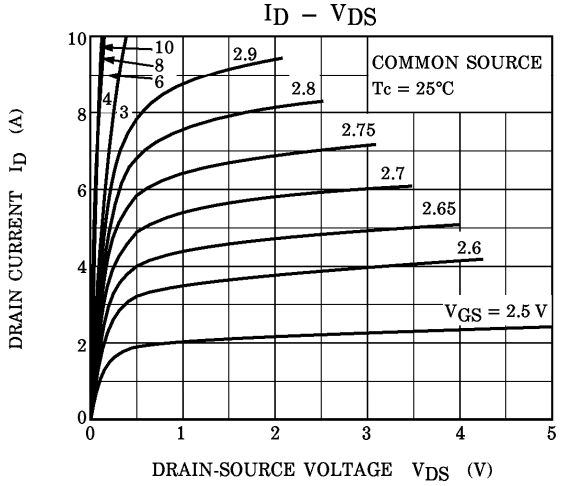
□□ — Month (Starting from Alphabet A)

Year (Last Number of the Christian Era)

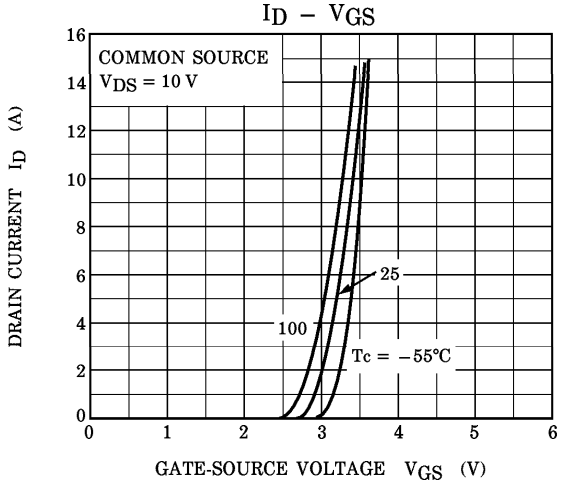
$I_D - V_{DS}$



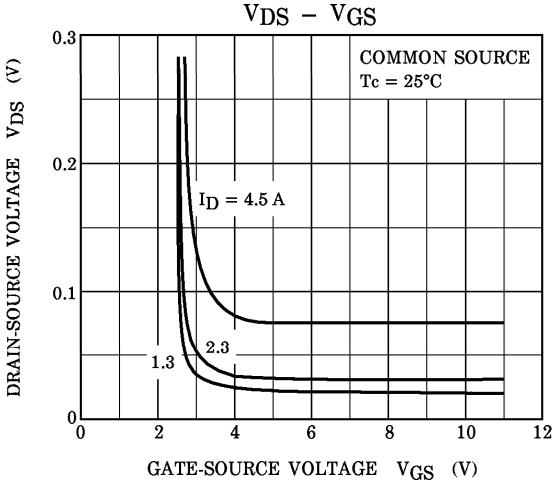
$I_D - V_{DS}$



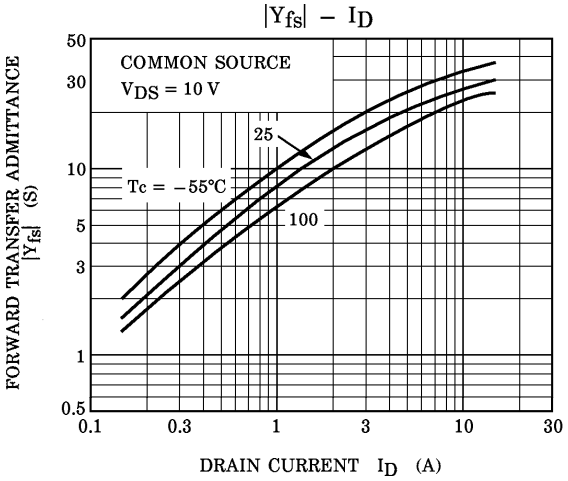
$I_D - V_{GS}$



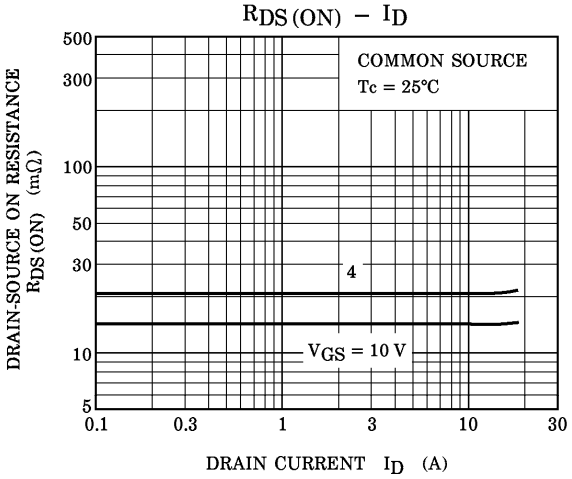
$V_{DS} - V_{GS}$



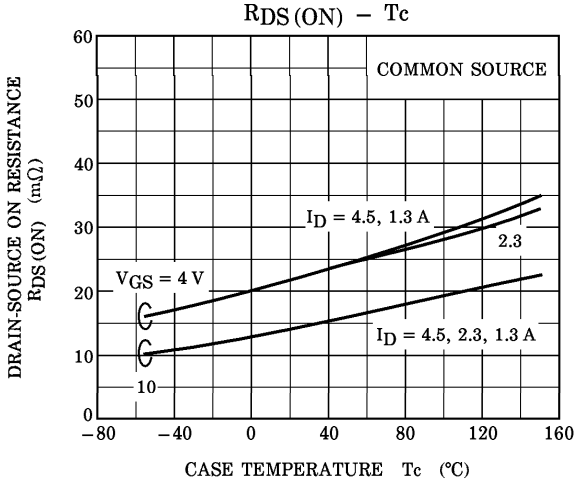
$|Y_{fs}| - I_D$



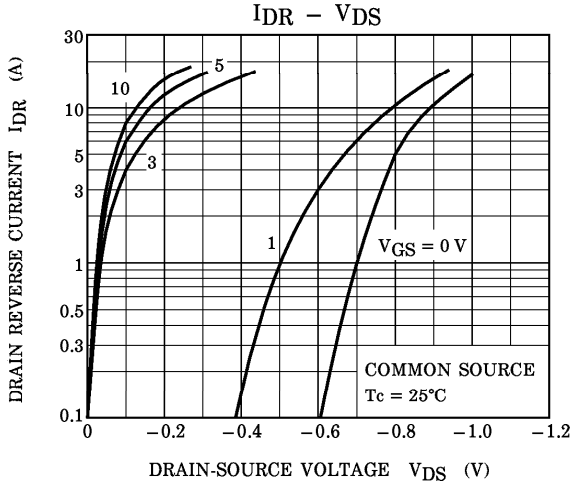
$R_{DS\,(ON)} - I_D$



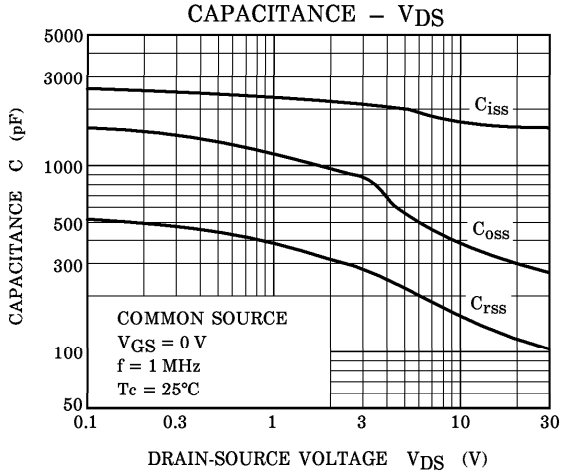
$R_{DS\,(ON)}$ – Tc



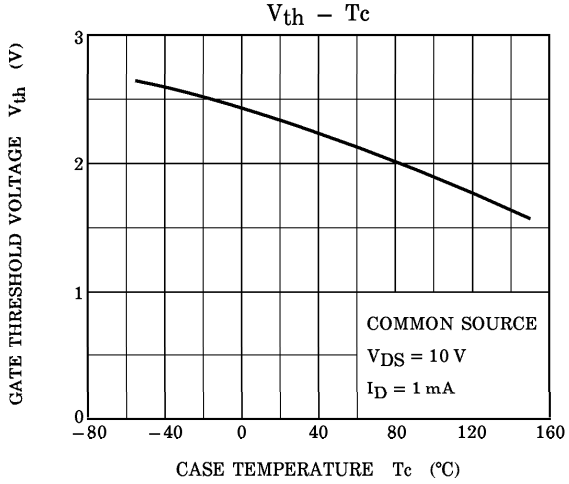
I_{DR} – V_{DS}



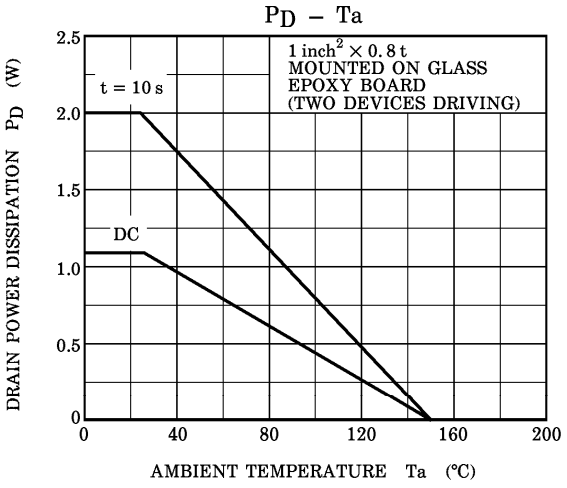
CAPACITANCE – V_{DS}



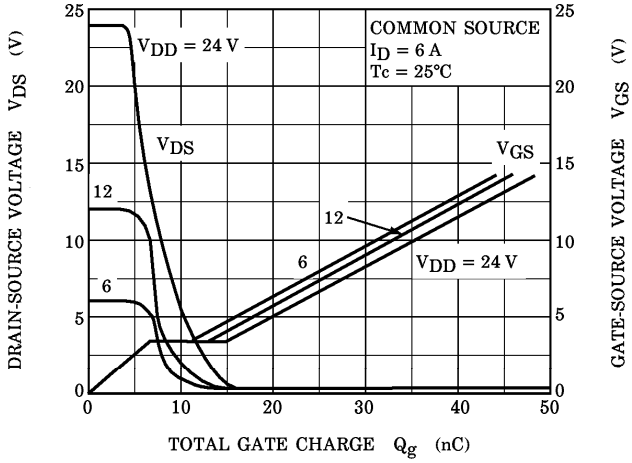
V_{th} – Tc



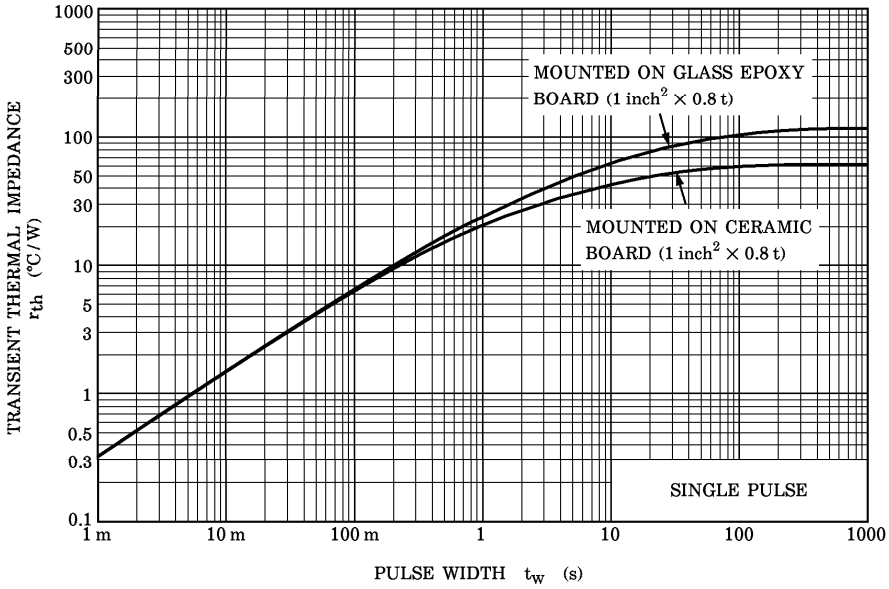
P_D – Ta



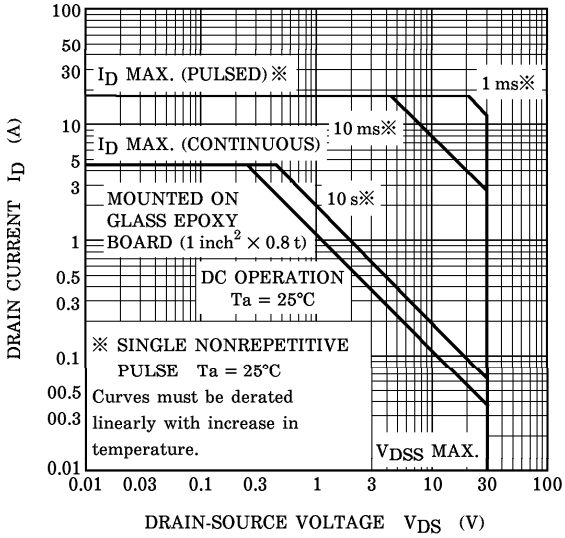
DYNAMIC INPUT / OUTPUT CHARACTERISTICS



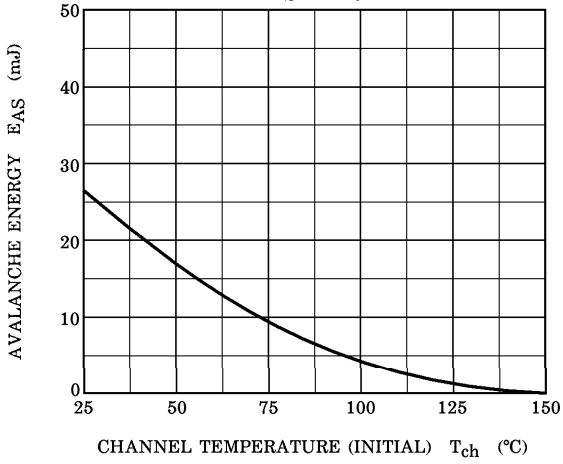
r_{th} – t_w

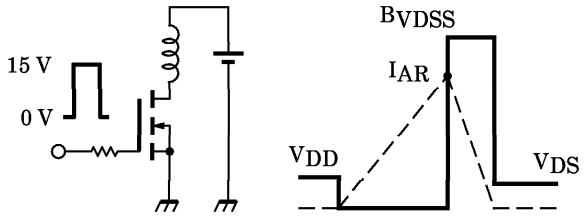


SAFE OPERATING AREA



E_{AS} – T_{ch}





Peak I_{AR} = 4.5 A, R_G = 25 Ω
V_{DD} = 24 V, L = 1.0 mH

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