

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

TPC8305

LITHIUM ION BATTERY

NOTE BOOK PC

PORTABLE MACHINES AND TOOLS

- Compact and thin package allows smaller mounting area.
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 24 \text{ m}\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 12 \text{ S}$ (Typ.)
- Low Leakage Current : $I_{DSS} = -10 \mu\text{A}$ (Max.) ($V_{DS} = -20 \text{ V}$)
- Enhancement-Mode : $V_{th} = -0.5 \sim -1.2 \text{ V}$
($V_{DS} = -10 \text{ V}$, $I_D = -1 \text{ mA}$)

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	-20	V
Drain-Gate Voltage ($R_{GS} = 20 \text{ k}\Omega$)		V_{DGR}	-20	V
Gate-Source Voltage		V_{GSS}	± 12	V
Drain Current	DC	I_D	-5	A
	Pulse	I_{DP}	-20	A
Drain Power Dissipation*** ($T_a = 25^\circ\text{C}$)		P_D	2.0	W
Single Pulse Avalanche Energy**		E_{AS}	32.5	mJ
Avalanche Current		I_{AR}	-5	A
Repetitive Avalanche Energy*		E_{AR}	0.2	mJ
Channel Temperature		T_{ch}	150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55~150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

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

Note ;

- * Repetitive rating ; Pulse Width Limited by Max. Junction temperature.
- ** $V_{DD} = -16 \text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 1.0 \text{ mH}$, $R_G = 25 \Omega$, $I_{AR} = -5 \text{ A}$
- *** Drive operation ; Mount on glass epoxy board [$1\text{inch}^2 \times 0.8 \text{ t}$] in the two devices driving ($t = 10 \text{ s}$)

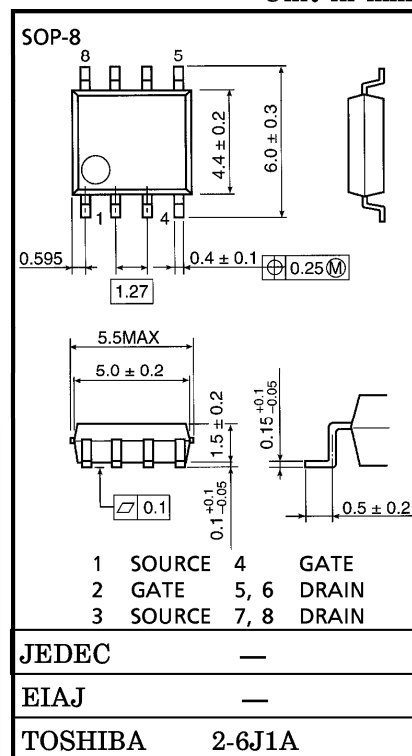
This transistor is an electrostatic sensitive device. Please handle with caution.

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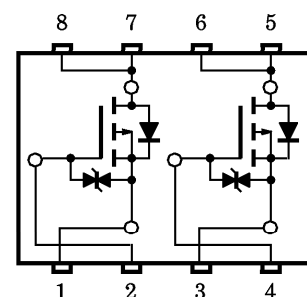
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INDUSTRIAL APPLICATIONS

Unit in mm



CIRCUIT CONFIGURATION



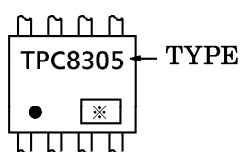
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I _{GSS}	V _{GS} = ±10 V, V _{DS} = 0 V	—	—	±10	μA	
Drain Cut-Off Current	I _{DSS}	V _{DS} = -20 V, V _{GS} = 0 V	—	—	-10	μA	
Drain-Source Breakdown Voltage	V _{(BR)DSS}	I _D = -10 mA, V _{GS} = 0 V	-20	—	—	V	
		I _D = -10 mA, V _{GS} = 12 V	-8	—	—		
Gate Threshold Voltage	V _{th}	V _{DS} = -10 V, I _D = -200 μA	-0.5	—	-1.2	V	
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} = -2.0 V, I _D = -2.5 A	—	56	80	mΩ	
	R _{DS(ON)}	V _{GS} = -2.5 V, I _D = -2.5 A	—	38	50	mΩ	
	R _{DS(ON)}	V _{GS} = -4.5 V, I _D = -2.5 A	—	24	30	mΩ	
Forward Transfer Admittance	Y _{fs}	V _{DS} = -10 V, I _D = -2.5 A	6	12	—	S	
Input Capacitance	C _{iss}	V _{DS} = -10 V, V _{GS} = 0 V f = 1 MHz	—	2030	—	pF	
Reverse Transfer Capacitance	C _{rss}		—	400	—		
Output Capacitance	C _{oss}		—	580	—		
Switching Time	Rise Time	t _r		—	25	—	ns
	Turn-On Time	t _{on}		—	35	—	
	Fall Time	t _f		—	95	—	
	Turn-Off Time	t _{off}		—	200	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q _g	V _{DD} ≐ -16 V, V _{GS} = -5 V	—	24	—	nC	
Gate-Source Charge	Q _{gs}	I _D = -5 A	—	17	—		
Gate-Drain ("Miller") Charge	Q _{gd}		—	7	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I _{DR}	—	—	—	-5	A
Pulse Drain Reverse Current	I _{DRP}	—	—	—	-20	A
Diode Forward Voltage	V _{DSSF}	I _{DR} = -5A, V _{GS} = 0V	—	—	1.2	V

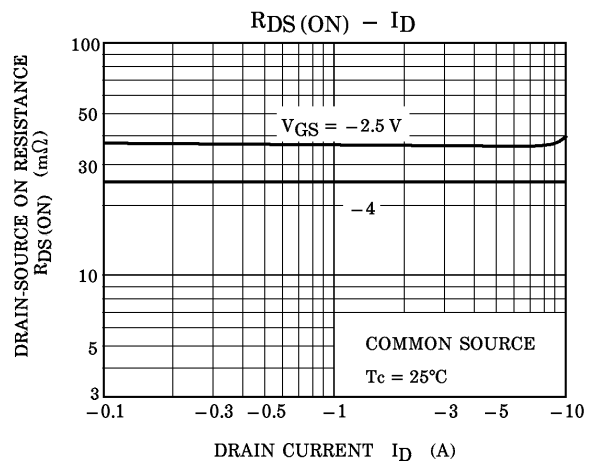
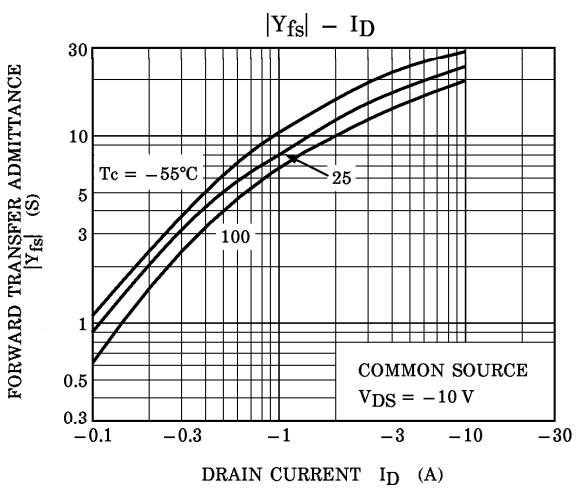
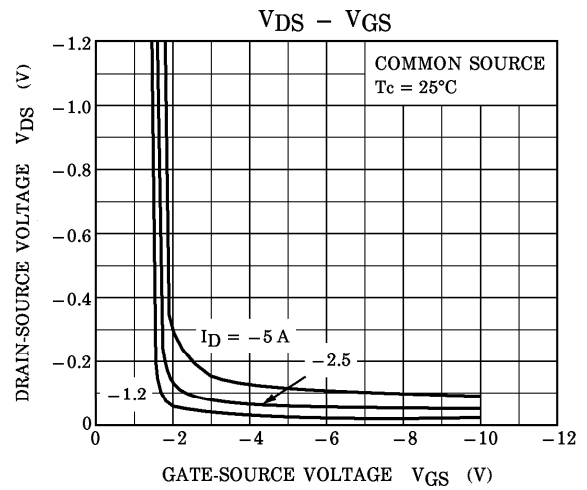
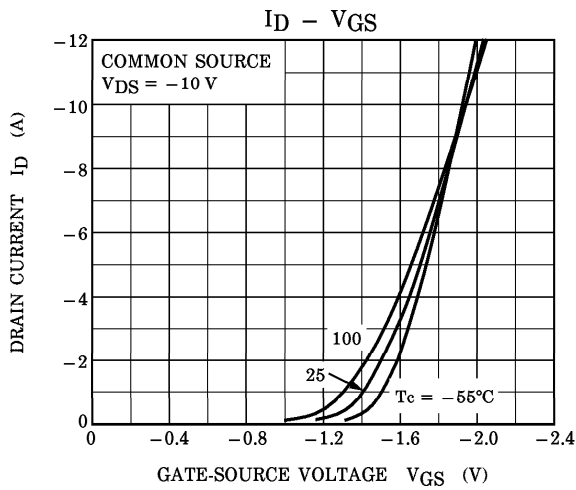
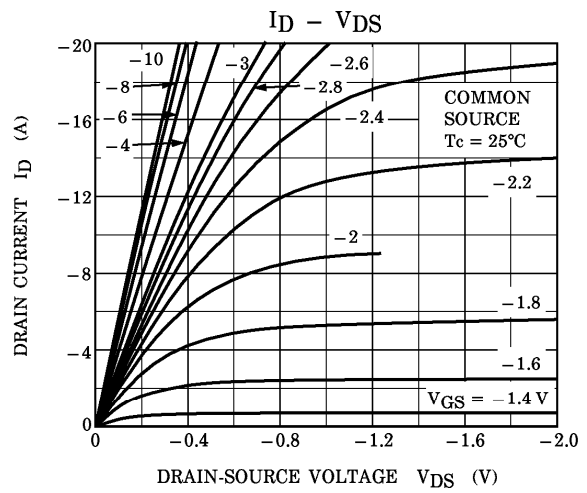
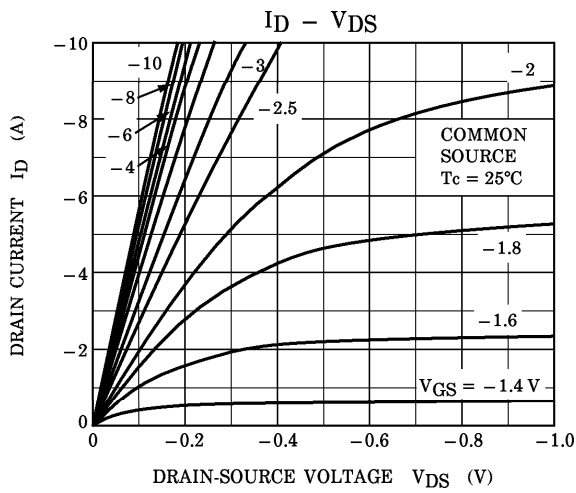
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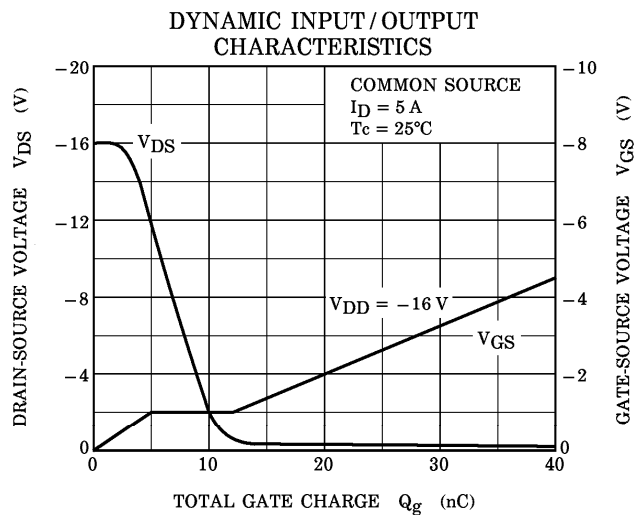
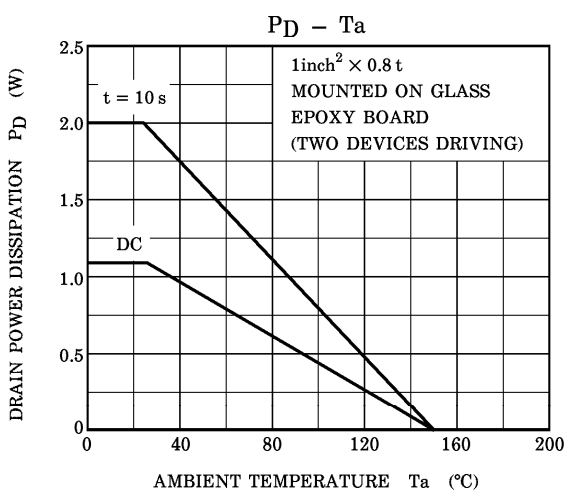
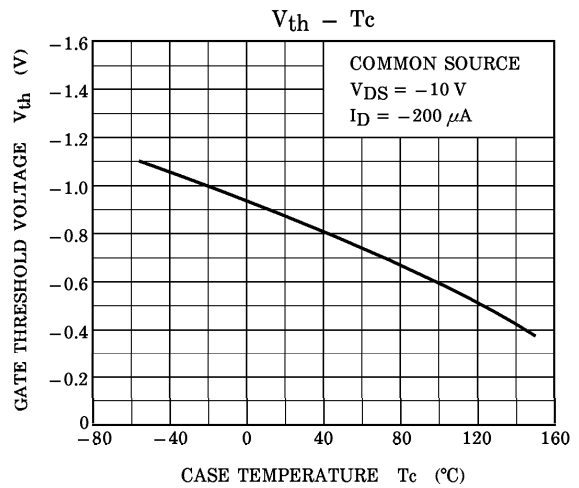
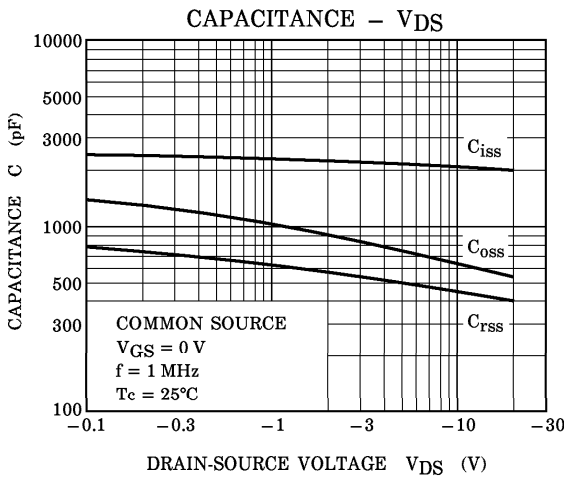
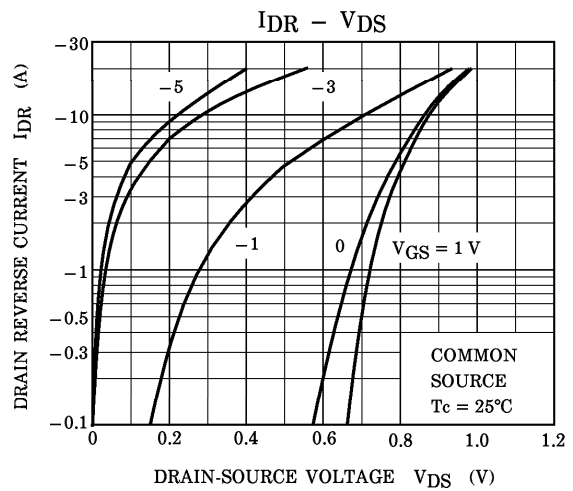
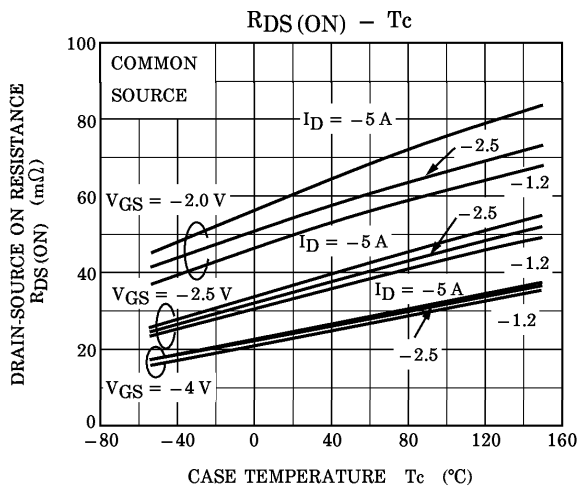


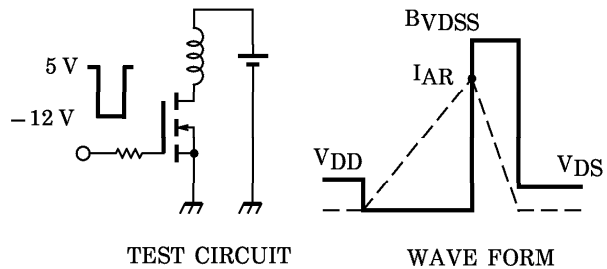
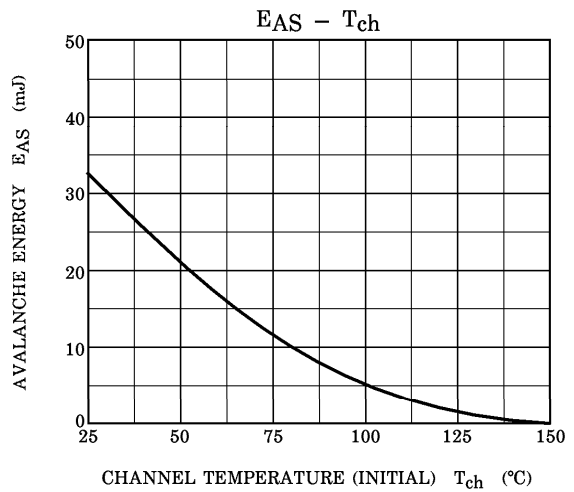
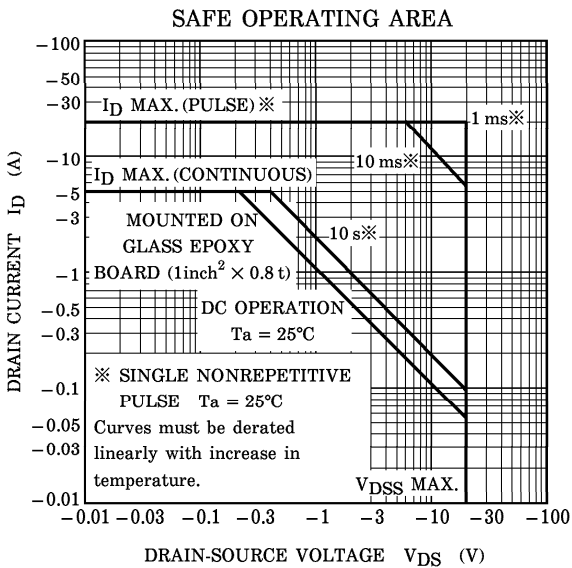
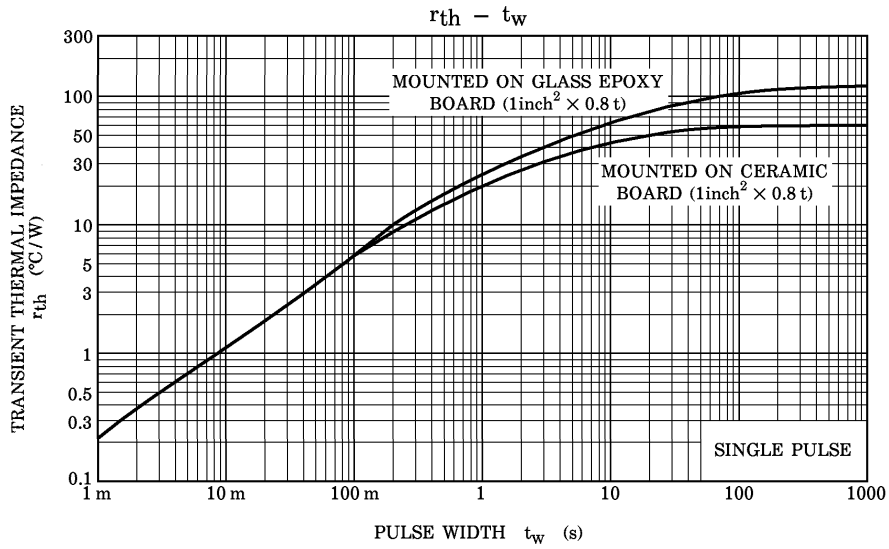
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = -5 \text{ A}$, $R_G = 25 \Omega$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$
 $V_{DD} = -16 \text{ V}$, $L = 1.0 \text{ mH}$