

TOSHIBA POWER MOS FET MODULE SILICON N & P CHANNEL MOS TYPE (L<sup>2</sup>-π-MOS<sup>IV</sup> 6 IN 1)

# MP6801

HIGH POWER, HIGH SPEED SWITCHING APPLICATIONS.

3-PHASE MOTOR DRIVE AND BIPOLAR DRIVE OF PULSE MOTOR.

- 4-Volt Gate Drive.
- Package with Heat Sink Isolated to Lead. (SIP 12Pin)
- High Drain Power Dissipation.  
: P<sub>T</sub>=40W @T<sub>c</sub>=25°C (6 Device Operation)
- Low Drain-Source ON Resistance  
: R<sub>DS(ON)</sub>=55mΩ (Typ.) (N-ch)  
90mΩ (Typ.) (P-ch)
- Low Leakage Current : I<sub>GSS</sub>= ±10μA (Max.) @V<sub>DS</sub>= ±16V  
: I<sub>DSS</sub>=100μA (Max.) @V<sub>DS</sub>=60V
- Enhancement-Mode : V<sub>th</sub>=0.8~2.0V @I<sub>D</sub>=1mA

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING		UNIT
		N-ch	P-ch	
Drain-Source Voltage	V <sub>DSS</sub>	60	-60	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	±20	V
Drain Current	I <sub>D</sub>	10	-10	A
Peak Drain Current	I <sub>DP</sub>	30	-30	
Drain Power Dissipation (1 Device Operation, Ta=25°C)	P <sub>D</sub>	3.0		W
Drain Power Dissipation (6 Devices Operation)	P <sub>T</sub>	5.0		W
		40		
Channel Temperature	T <sub>ch</sub>	150		°C
Storage Temperature Range	T <sub>stg</sub>	-55~150		°C

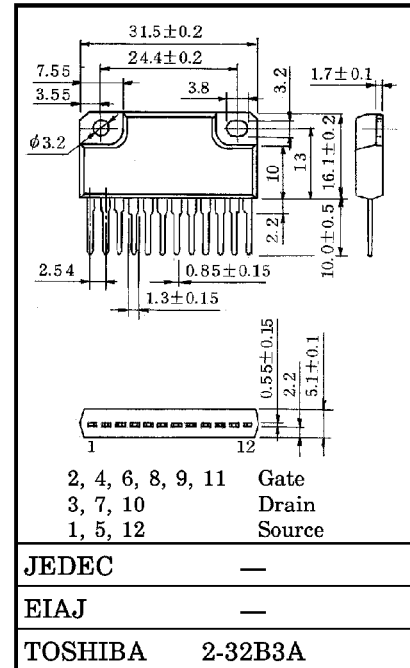
THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance of Junction to Ambient (6 Devices Operation, Ta=25°C)	ΣR <sub>th(j-a)</sub>	25	°C/W
Thermal Resistance of Junction to Case (6 Devices Operation, Tc=25°C)	ΣR <sub>th(j-c)</sub>	3.12	°C/W
Maximum Lead Temperature for Soldering Purposes (3.2mm from Case for 10s)	T <sub>L</sub>	260	°C

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

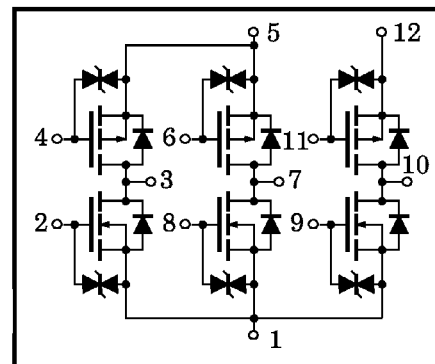
INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 6g

ARRAY CONFIGURATION



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ELECTRICAL CHARACTERISTICS (Ta = 25°C) (N-ch MOS FET)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16V, VDS = 0	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 60V, VGS = 0	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR) DSS	ID = 10mA, VGS = 0	60	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	0.8	—	2.0	V
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 5A	5	11	—	S
Drain-Source ON Resistance		RDS(ON)	ID = 5A, VGS = 4V	—	80	115	mΩ
Drain-Source ON Resistance		RDS(ON)	ID = 5A, VGS = 10V	—	55	80	
Input Capacitance		Ciss	VDS = 10V, VGS = 0, f = 1MHz	—	750	—	pF
Reverse Transfer Capacitance		Crss		—	170	—	
Output Capacitance		Coss		—	450	—	
Switching Time	Rise Time	tr		—	60	—	ns
	Turn-on Time	ton		—	80	—	
	Fall Time	tf		—	150	—	
	Turn-off Time	t <sub>off</sub>		VIN : tr, tf < 5ns Du. ≤ 1% (ZOUT = 50Ω)	—	400	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	ID = 10A, VGS = 10V	—	30	—	nC
Gate-Source Charge		Qgs	VDD = 48V	—	20	—	
Gate-Drain ("Miller") Charge		Qgd		—	10	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Drain Reverse Current	IDR	—	—	—	-10	A
Peak Drain Reverse Current	IDRP	—	—	—	-30	A
Diode Forward Voltage	VDSF	IDR = 10A, VGS = 0	—	-1.0	-1.7	V
Reverse Recovery Time	t <sub>rr</sub>	IDR = 10A, VGS = 0	—	110	—	ns
Reverse Recovery Charge	Q <sub>rr</sub>	dIDR / dt = -50A / μs	—	0.27	—	μC

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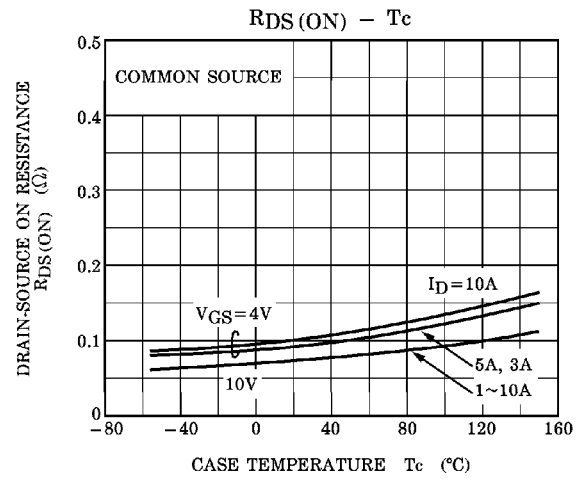
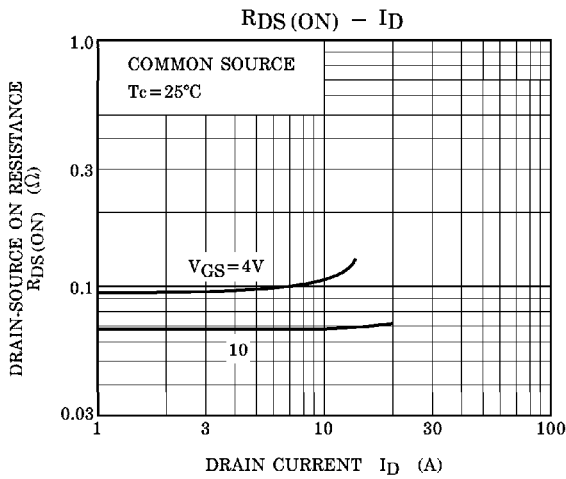
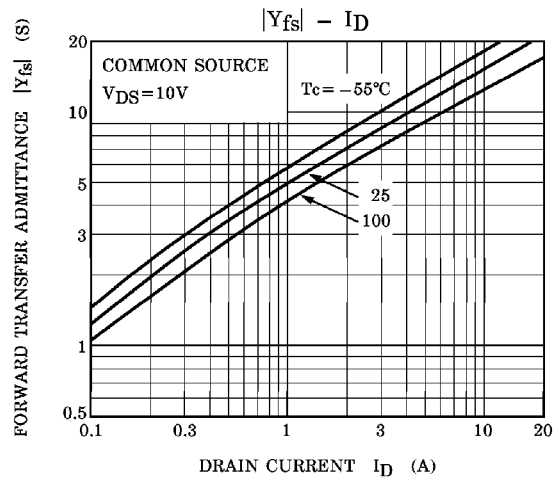
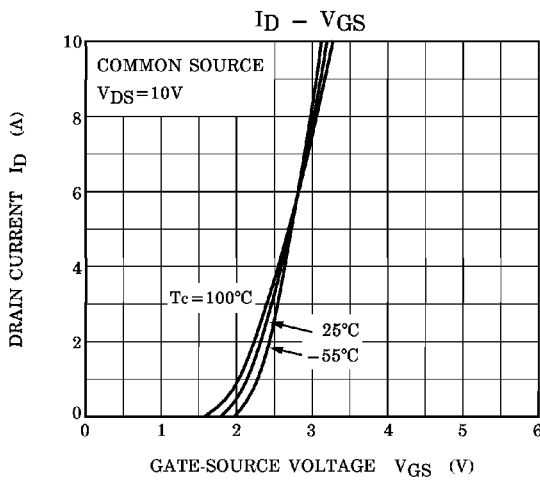
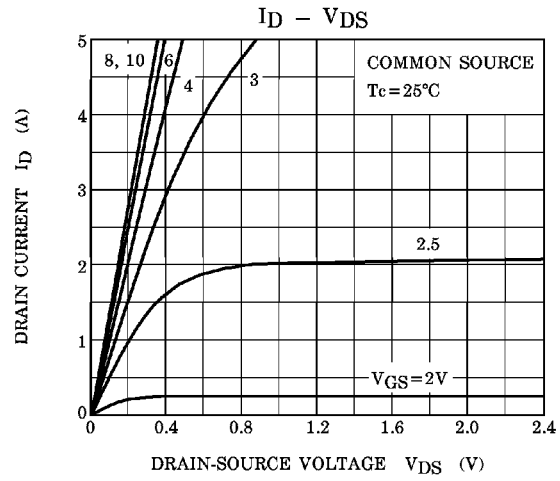
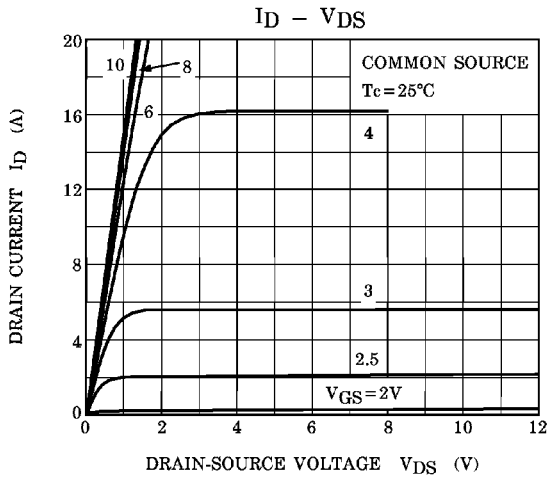
ELECTRICAL CHARACTERISTICS (Ta = 25°C) (P-ch MOS FET)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16V, VDS = 0	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = -60V, VGS = 0	—	—	-100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = -10mA, VGS = 0	-60	—	—	V
Gate Threshold Voltage		Vth	VDS = -10V, ID = -1mA	-0.8	—	-2.0	V
Forward Transfer Admittance		Yfs	VDS = -10V, ID = -5A	3.5	8.0	—	S
Drain-Source ON Resistance		RDS(ON)	ID = -5A, VGS = -4V	—	145	200	mΩ
Drain-Source ON Resistance		RDS(ON)	ID = -5A, VGS = -10V	—	90	125	
Input Capacitance		Ciss	VDS = -10V, VGS = 0, f = 1MHz	—	1200	—	pF
Reverse Transfer Capacitance		Crss		—	220	—	
Output Capacitance		Coss		—	550	—	
Switching Time	Rise Time	tr		—	60	—	ns
	Turn-on Time	ton		—	80	—	
	Fall Time	tf		—	120	—	
	Turn-off Time	toff		VIN : tr, tf < 5ns Du. ≤ 1% (ZOUT = 50Ω)	—	350	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	ID = -10A, VGS = -10V	—	45	—	nC
Gate-Source Charge		Qgs	VDD = -48V	—	30	—	
Gate-Drain ("Miller") Charge		Qgd		—	15	—	

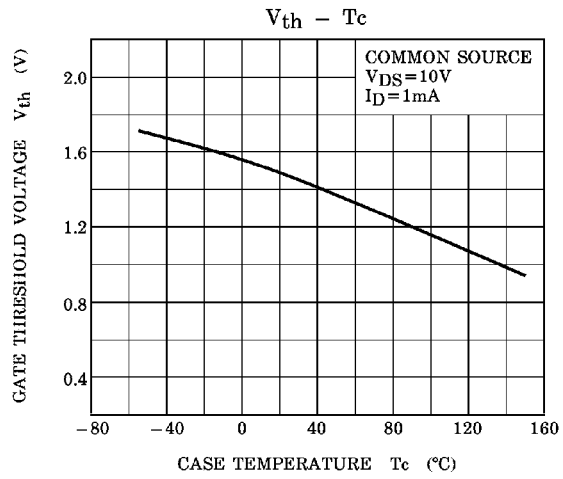
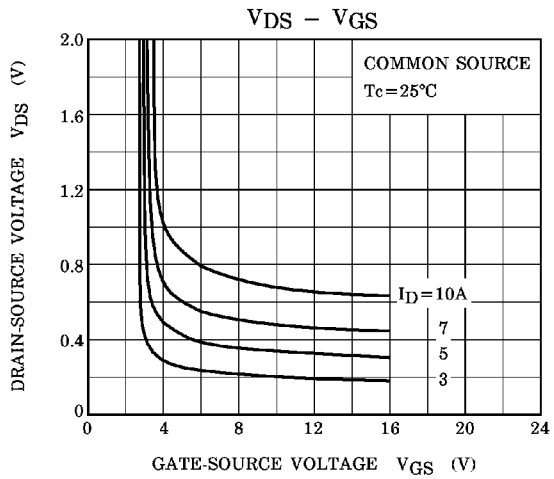
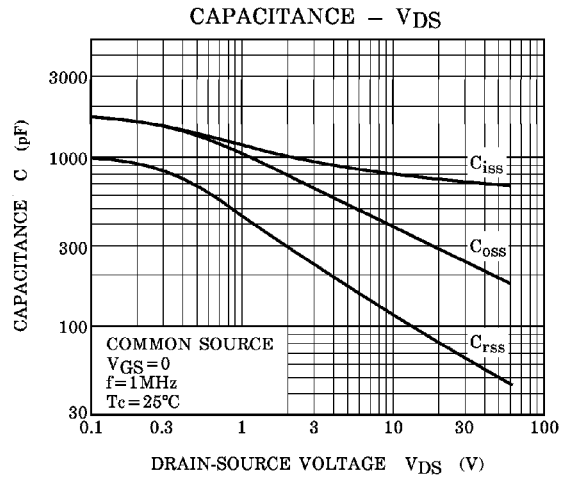
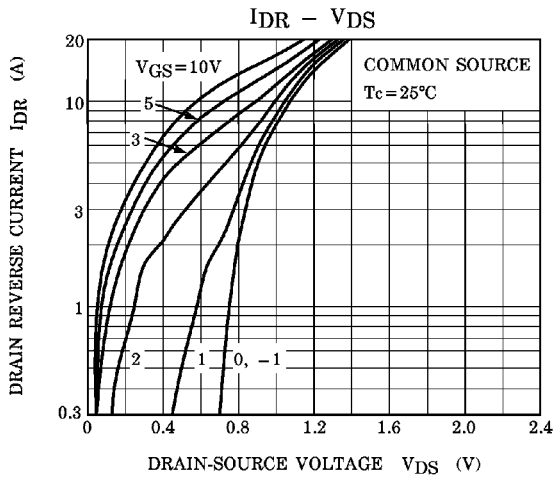
SOURCE-DRAIN DIODE RATING AND CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Drain Reverse Current	IDR	—	—	—	-10	A
Peak Drain Reverse Current	IDRP	—	—	—	-30	A
Diode Forward Voltage	VDSF	IDR = -10A, VGS = 0	—	-0.9	-1.7	V
Reverse Recovery Time	trr	IDR = -10A, VGS = 0	—	110	—	ns
Reverse Recovery Charge	Qrr	dIDR / dt = 50A / μs	—	0.18	—	μC

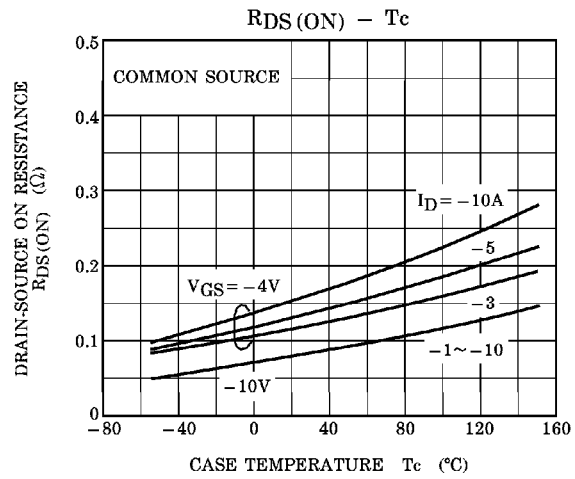
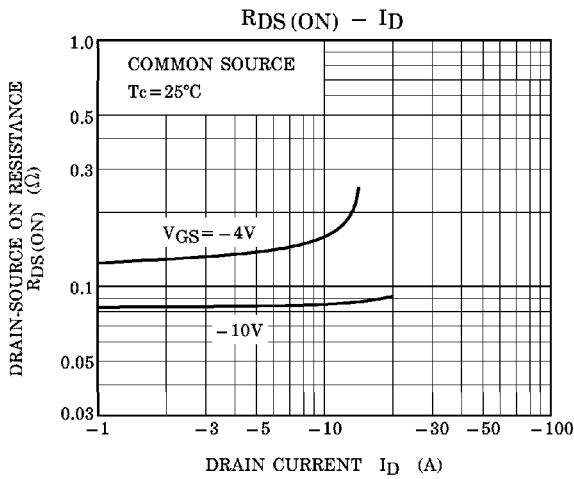
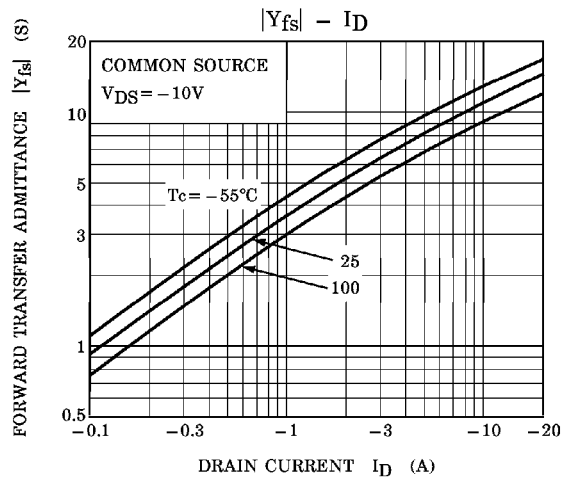
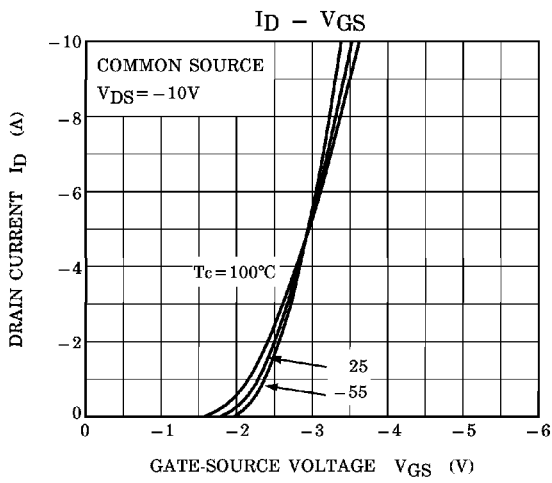
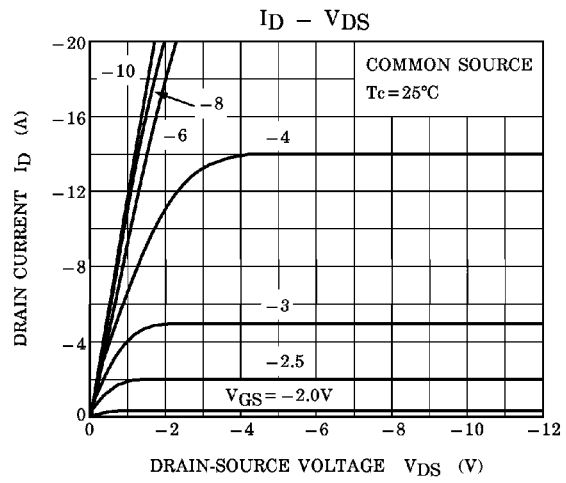
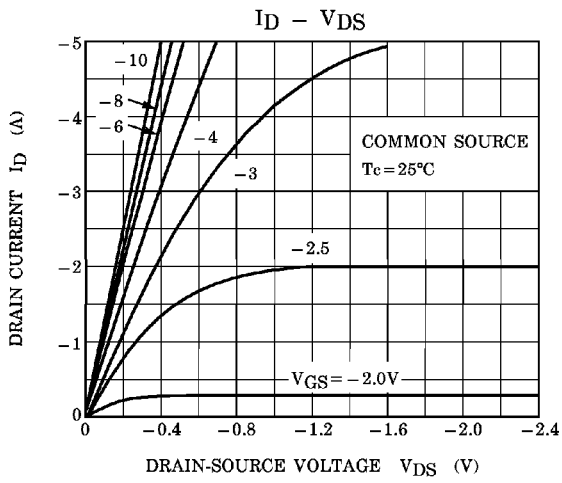
N-ch



N-ch



P-ch



P-ch

