

Compact and highly integrated electronic devices in signal processing and power stages are in great demand... power modules are highly integrated devices with simple organization that meet such requirement.

Toshiba's Power MOS FET Module Series products are discrete multi-chip modules that resin-seal three to six power MOS FET chips in a single module (the power MOS FETs are taking over the position of bipolar transistors in a rapid pace).

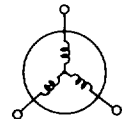
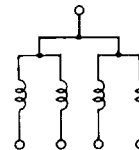
Power MOS FET modules make high-density mounting of power devices easy. They are optimal for general-purpose solenoid drive, matrix LED drive, head-pin drive of a printer, and for power drivers used in various small motors (pulse motor, normal/reverse rotation control motor, 3-phase motor).

■ Features






- (1) Possible to drive in 5V power supply systems for S-8, S-10, S-12 and F-12 series.
 - On-resistance at VGS=4V and gate-drive voltage have restrictions.
- (2) Basic features are same as discrete power MOS FETs.
- (3) Discrete chip products.
 - No parasitic device (IC) is placed between the units; therefore, operation is stable.
 - The safety operating area and allowable power dissipation characteristics are advantageous over monolithic array products. Optimal for use which requires high power.
- (4) Ample package variations support diverse application fields.

■ Typical Applications

- Solenoid
- Pulse motor
- DC motor (normal/reverse rotation)
- 3-phase (normal/reverse rotation)



■ Recommended Product Types Classified by Applications

Application		Package	S-8	S-10	S-12	F-12	L-14
Output channel	Output type						
		Voltage rating (V)	60~100	60~100	60~100	60~100	80~450
		Current rating (A)	2~5	2~5	2~5	3~10	5~10
3ch	Sink driver (N×3)		MP3202				
4ch	Sink driver (N×4)			MP4205	MP4404	MP4704	
	Source driver (P×4)			MP4203		* MP4705	
	Sink driver with FD** (N×4)				MP4403	MP4703	
	Source driver with FD** (P×4)					* MP4706	
	H-switch driver (N×2+P×2)			* MP4207			
5ch	Sink driver (N×5)				* MP5401		
	Source driver (P×5)				* MP5402		
6ch	3-phase bridge driver (N×3+P×3)				MP6401 * MP6403	* MP6801	
	3-phase bridge driver (N×6)						MP6101

** : Flyback voltage absorber diode

* : Under development

Power MOS FET Modules

Lineup

Electrical characteristics			Package classifications (): Equivalent circuit							
V _{DSS} (V)	I _D (A)	R _{DS(ON)} (MAX.) @V _{GS} =10V (Ω)	Full mold type					Insulating type with heatsink		
			S-8	S-10	S-12			F-12		L-14
			SIP 8 Pin	SIP 10 Pin	SIP 12 Pin			SIP 12 Pin		SIP 14 Pin
			2.54-pitch	2.54-pitch	2.54-pitch			2.54-pitch		4.0-pitch
			3 in 1	4 in 1	4 in 1	5 in 1	6 in 1	4 in 1	6 in 1	6 in 1
60	2	0.37		MP4205 (B)	*MP4406 (E)					
60	5	0.24		*MP4204 (B)	*MP4405 (E)					
60	5	0.20	MP3202 (A)	MP4202 (B)	MP4408 (E)					
-60	-5	0.40		MP4203 (C)				*MP4705 (I)		
±60	±5	0.24/0.40						MP6401 (H)		
60	5	0.13				*MP5401 (M)				
-60	-5	0.25				*MP5402 (N)				
±60	±5	0.13/0.25		*MP4207 (K)				*MP6403 (L)		
±60	±10	0.08/0.125							*MP6801 (L)	
120	3	0.45	MP3201 (A)	MP4201 (B)	MP4401 (E) MP4402 (D)			MP4701 (E) MP4702 (D)		
120	5	0.30			MP4403 (E) MP4404 (D)			MP4703 (E) MP4704 (D)		
-120	-5	0.72						*MP4706 (J) *MP4707 (I)		
250	10	0.35								MP6101 (F)

*: Under development

Performance Chart

Type No.	Maximum ratings			Package	R _{DS(ON)} (Ω)				Organization
	V _{DSS} (V)	I _D (A)	P _T (W)		V _{GS} =10V		V _{GS} =4V		
					TYP.	MAX.	TYP.	MAX.	
MP3201	120	3	3	S-8	0.33	0.45	0.42	0.74	3 in 1 N×3
MP3202	60	5	3	S-8	0.12	0.20	0.20	0.32	3 in 1 N×3
MP4201	120	3	4	S-10	0.33	0.45	0.42	0.74	4 in 1 N×4
MP4202	60	5	4	S-10	0.12	0.20	0.20	0.32	4 in 1 N×4
MP4203	-60	-5	4	S-10	0.3	0.4	0.45	0.80	4 in 1 P×4
*MP4204	60	5	4	S-10	0.15	0.24	0.25	0.40	4 in 1 N×4
MP4205	60	2	4	S-10	0.28	0.40	0.39	0.60	4 in 1 N×4
*MP4207	±60	±5	4	S-10	P-channel 0.17 N-channel 0.09	0.25 0.13	0.250 0.135	0.400 0.180	4 in 1 P×2+N×2
MP4401	120	3	4.4	S-12	0.33	0.45	0.42	0.74	4 in 1 N×4 with FD
MP4402	120	3	4.4	S-12	0.33	0.45	0.42	0.74	4 in 1 N×4
MP4403	120	5	4.4	S-12	0.20	0.30	0.28	0.44	4 in 1 N×4 with FD
MP4404	120	5	4.4	S-12	0.20	0.30	0.28	0.44	4 in 1 N×4
MP4405	60	5	4.4	S-12	0.15	0.24	0.23	0.38	4 in 1 N×4 with FD
MP4406	60	2	4.4	S-12	0.28	0.40	0.39	0.60	4 in 1 N×4 with FD
MP4408	60	5	4.4	S-12	0.12	0.20	0.20	0.32	4 in 1 N×4 with FD
MP4701	120	3	*36	F-12	0.33	0.45	0.42	0.74	4 in 1 N×4 with FD
MP4702	120	3	*36	F-12	0.33	0.45	0.42	0.74	4 in 1 N×4
MP4703	120	5	*36	F-12	0.20	0.30	0.28	0.44	4 in 1 N×4 with FD
MP4704	120	5	*36	F-12	0.20	0.30	0.28	0.44	4 in 1 N×4
*MP4705	-60	-5	*36	F-12	0.30	0.40	0.45	0.80	4 in 1 P×4
*MP4706	-120	-5	*36	F-12	0.50	0.72	0.65	1.00	4 in 1 P×4 with FD
*MP4707	-120	-5	*36	F-12	0.50	0.72	0.65	1.00	4 in 1 P×4
*MP5401	60	5	4.4	S-12	0.09	0.13	0.135	0.180	5 in 1 N×5
*MP5402	-60	-5	4.4	S-12	0.17	0.25	0.250	0.400	5 in 1 P×5
MP6101	250	10	*120	L-14	0.27	0.35	—	—	6 in 1 N×6
MP6401	±60	±5	4.4	S-12	P-channel 0.30 N-channel 0.12	0.40 0.20	0.45 0.20	0.80 0.32	6 in 1 P×3+N×3
*MP6403	±60	±5	4.4	S-12	P-channel 0.17 N-channel 0.09	0.245 0.125	0.25 0.135	0.40 0.20	6 in 1 P×3+N×3
*MP6801	±60	±10	*40	F-12	P-channel 0.09 N-channel 0.055	0.125 0.080	0.145 0.80	0.200 0.115	6 in 1 P×3+N×3

*T_C=25°C *: Under development

Equivalent Circuits

