TM60P06P

P-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

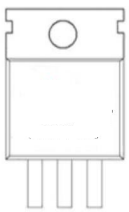
V_{DS} = -60V I_D =-60A

$R_{DS(ON)}$= 16.5 mΩ(typ.) @ V_{GS}=-10V

100% UIS Tested

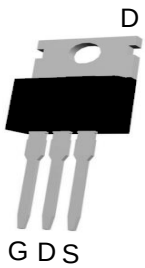
100% R_g Tested

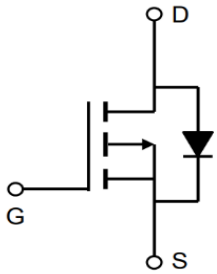
Green Product



Marking 60P06

P:TO-220AB





Absolute Maximum Ratings (TC=25℃ unless otherwise specified)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current-T_C=25℃	-60	A
	Continuous Drain Current-T_C=100℃	-49	A
I_{DM}	Pulsed Drain Current[1]	-270	A
P_D	Total Power Dissipation	300	W
E_{AS}	Single Pulsed Avalanche Energy	750	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	0.417	℃/W

Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=-250μA	-60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=-60V	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=-250μA	-1.1	-1.6	-2.2	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V,I_D=-20A	---	16	19	mΩ
		V_{GS}=-4.5V,I_D=-20A	---	20	24	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-20V, V_{GS}=0V, f=1MHz	---	2990	---	pF
C_{oss}	Output Capacitance		---	258	---	
C_{rss}	Reverse Transfer Capacitance		---	211	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=-30V, I_D=-20A, V_{GS}=-10V, R_G=1Ω	---	23	---	ns
t_r	Rise Time		---	17	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	55	---	ns
t_f	Fall Time		---	29	---	ns
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DS}=-30V, I_D=-20A	---	114	---	nC
Q_{gs}	Gate-Source Charge		---	27.3	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	49	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Drain Diode Forward Voltage	V_{GS}=0V,I_S=-20A	---	---	-1.2	V
I_S	Continuous Source Current	V_G=V_D=0V	---	---	-60	A
I_{SM}	Pulsed Source Current		---	---	-290	A
Trr	Reverse Recovery Time	T J = 25° C, IF =-20A, di/dt =100A/μs	---	117	---	nS
Qrr	Reverse Recovery Charge		---	420	---	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T J =25℃, VDD =-25V, VG =-5V, RG =25Ω, L=0.5mH, IAS
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics

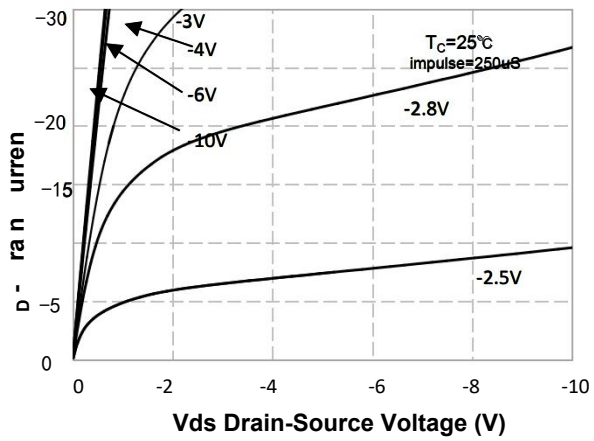


Figure 1. On-Region Characteristics

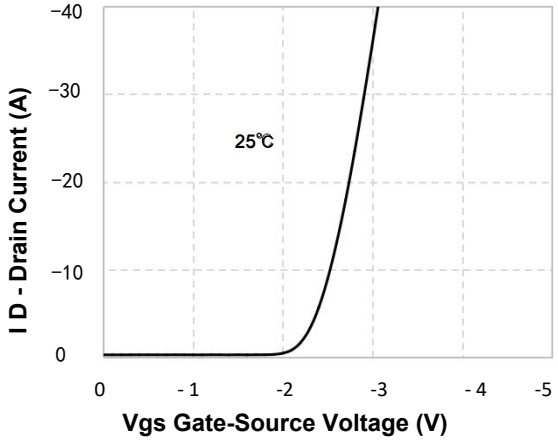


Figure 2. Transfer Characteristics

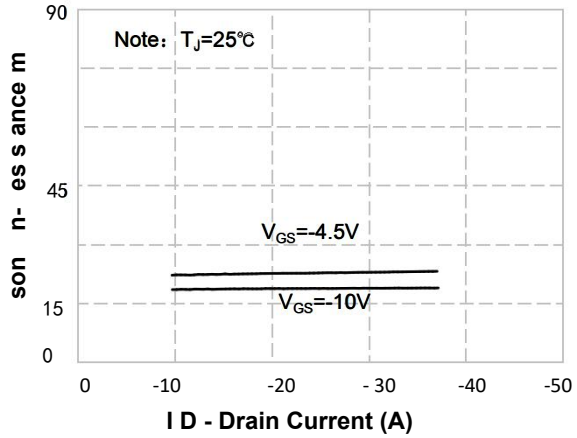


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

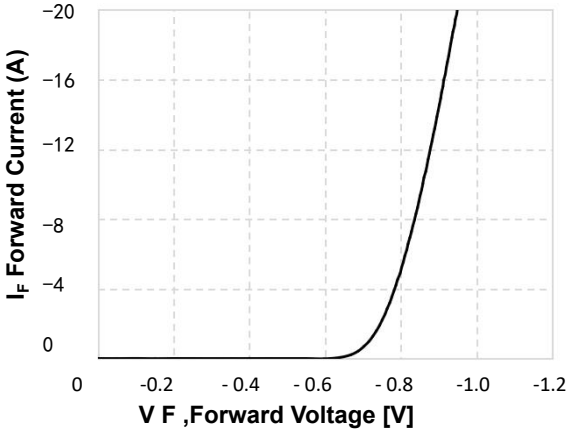


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

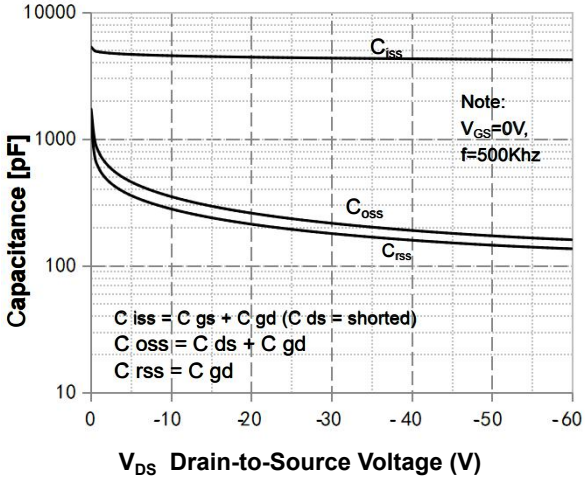


Figure 5. Capacitance Characteristics

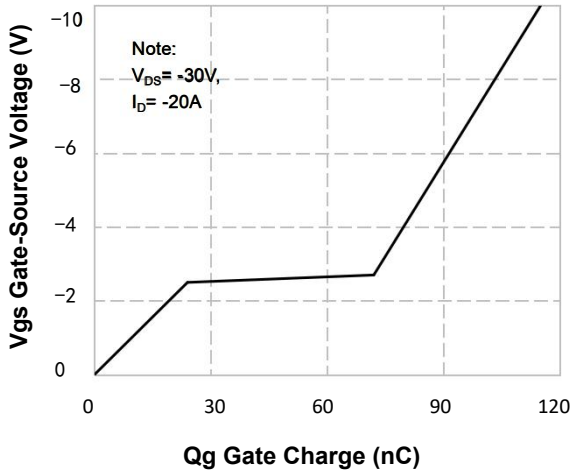


Figure 6. Gate Charge Characteristics

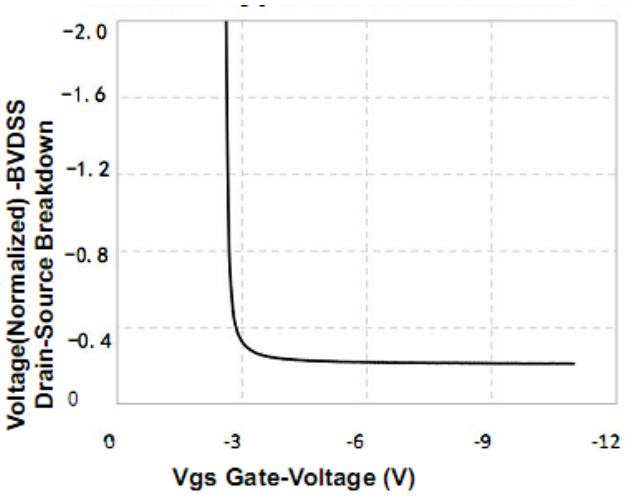


Figure 7. Breakdown Voltage Variation vs Gate-Voltage

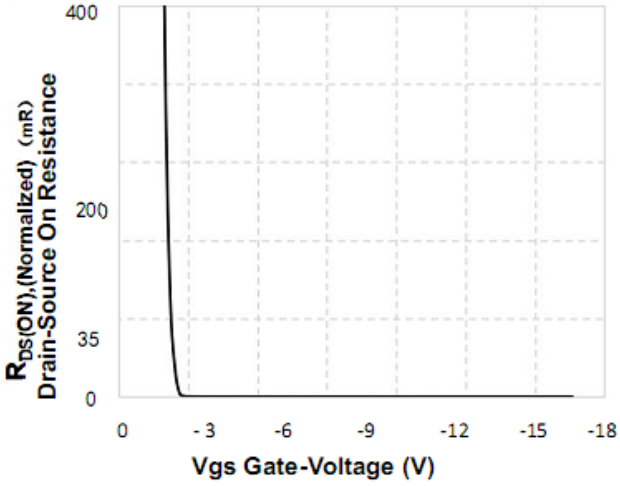


Figure 8. On-Resistance Variation vs Gate Voltage

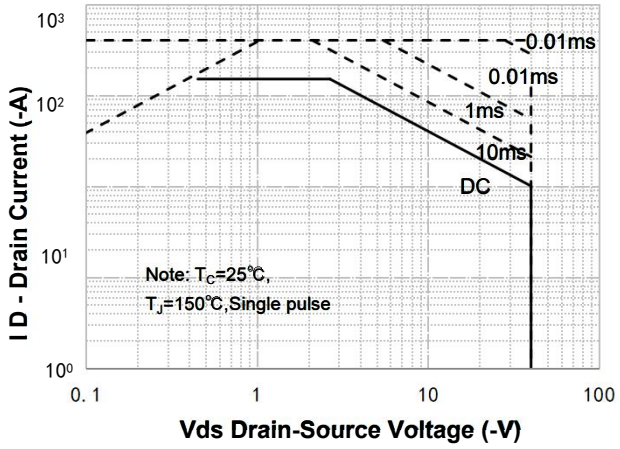


Figure 9. Maximum Safe Operating Area

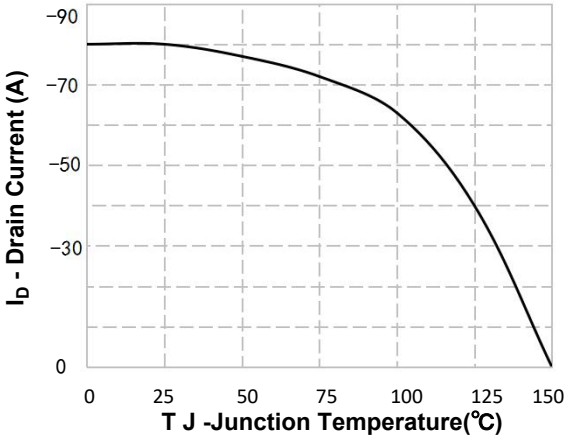


Figure 10. Maximum PContinuous Drain Currentvs Case Temperature

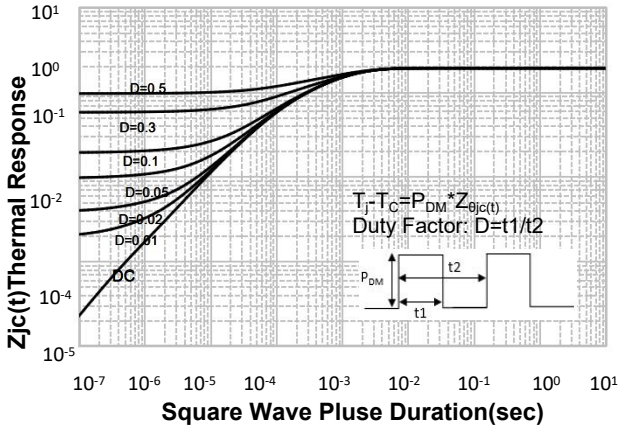
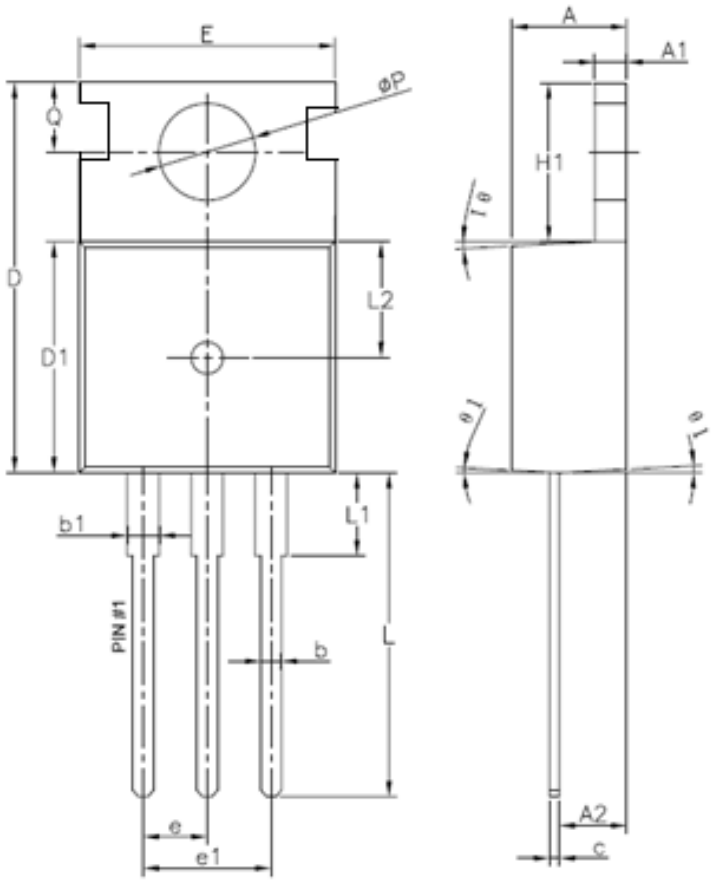


Figure 11. Transient Thermal Response Curve

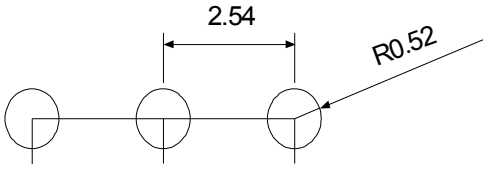
Package Information:TO-220AB



SYMBOL	TO-220			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	3.56	4.83	0.140	0.190
A1	0.51	1.40	0.020	0.055
A2	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b2	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.22	16.51	0.560	0.650
D1	8.38	9.02	0.330	0.355
D2	12.19	13.65	0.480	0.537
E	9.65	10.67	0.380	0.420
E1	6.86	8.89	0.270	0.350
e	2.54 BSC		0.100 BSC	
H1	5.84	6.86	0.230	0.270
L	12.70	14.73	0.500	0.580
L1	-	6.35	-	0.250
P	3.53	4.09	0.139	0.161
Q	2.54	3.43	0.100	0.135

Note: Follow JEDEC TO-220 AB.

RECOMMENDED LAND PATTERN



UNIT: mm