

TM10P06S

P-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

General Features

$V_{DS} = -60V$ $I_D = -10A$

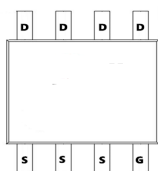
$R_{DS(ON)} = 24 m\Omega$ (typ.) @ $V_{GS} = -10V$

100% UIS Tested

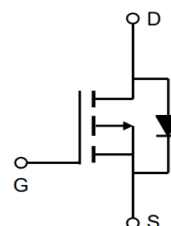
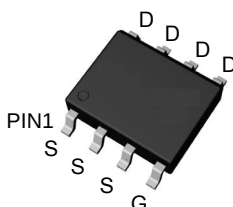
100% R_g Tested



S:SOP-8L



Marking:10P06



Absolute Maximum Ratings: ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	-10	A
	Continuous Drain Current- $T_C = 100^\circ C$	-7.0	
I_{DM}	Pulsed Drain Current ¹	-38	
P_D	Power Dissipation	4.1	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	30	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	$^\circ C/W$

TM10P06S
P-Channel Enhancement Mosfet
Electrical Characteristics: ($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μA	-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 =250 μA	-1	-1.8	-2.5	V
R _{DS(on)}	Drain-Source On Resistance②	V _{GS} =-10V, I _D =-15A	---	24	29	mΩ
		V _{GS} =-4.5V, I _D =-10A	---	30	39	
G _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-15A	---	35	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-25V, V _{GS} =0V, f=1MHz	---	2025	---	pF
C _{oss}	Output Capacitance		---	133	---	
C _{rss}	Reverse Transfer Capacitance		---	97	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =-30V R _{GEN} =3 Ω, V _{GS} =-10V	---	12	---	ns
t _r	Rise Time		---	9	---	ns
t _{d(off)}	Turn-Off Delay Time		---	63	---	ns
t _f	Fall Time		---	13	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-30V, I _D =-20A	---	53	---	nC
Q _{gs}	Gate-Source Charge		---	10	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	12	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage ³	V _{GS} =0V, I _S =-15A, T _J =25℃	---	-0.88	-1.2	V
I _S	Continuous Drain Current	V _D =V _G =0V	---	-9	---	V
I _{SM}	Pulsed Drain Current	V _D =V _G =0V	---	-5.2	---	V
t _{rr}	Reverse Recovery Time	I _S =-20A, V _{GS} =0V	---	26	---	ns
Q _{rr}	Reverse Recovery Charge	.dI/dt=-500A/μs	---	29	---	nC

Notes:

1.Repetitive Rating: Pulse width limited by maximum junction temperature.

2. E_{AS} condition: $T_J=25^\circ\text{C}, V_{DD}=40V, V_G=-10V, R_g=25\Omega, L=0.5mH$.

3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Characteristics: ($T_c=25^\circ\text{C}$ unless otherwise noted)

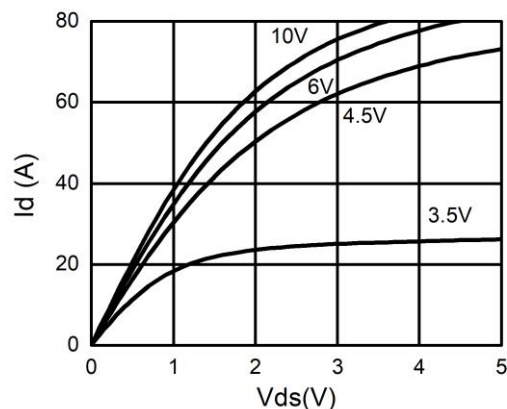


Figure 1. Output Characteristics

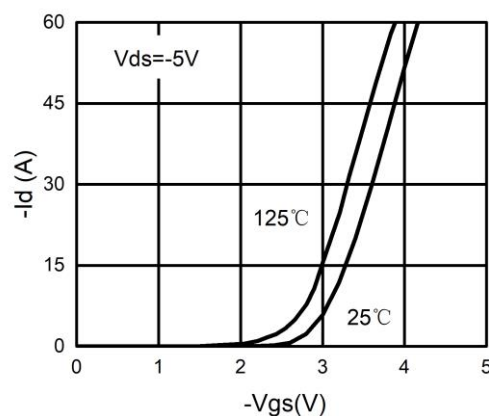


Figure 2. Transfer Characteristics

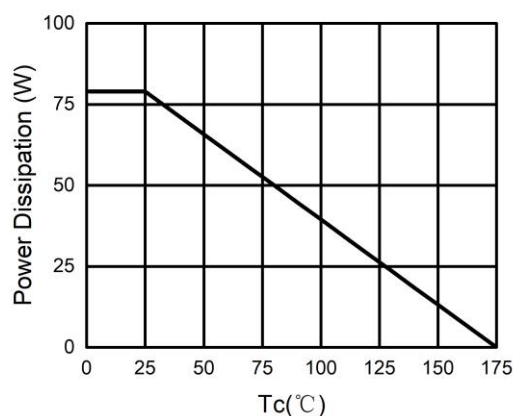


Figure 3. Power Dissipation

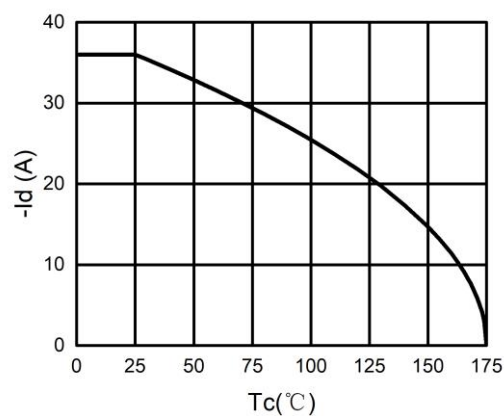


Figure 4. Drain Current

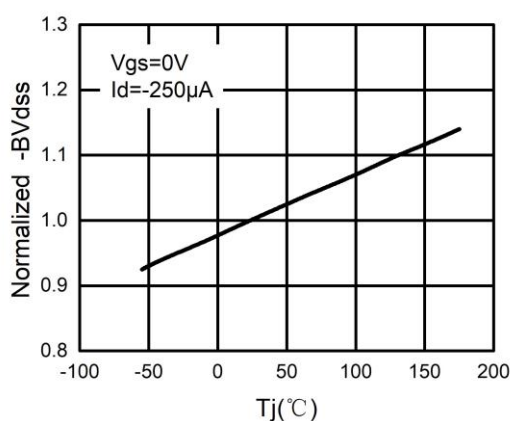


Figure 5. BV_{DSS} vs Junction Temperature

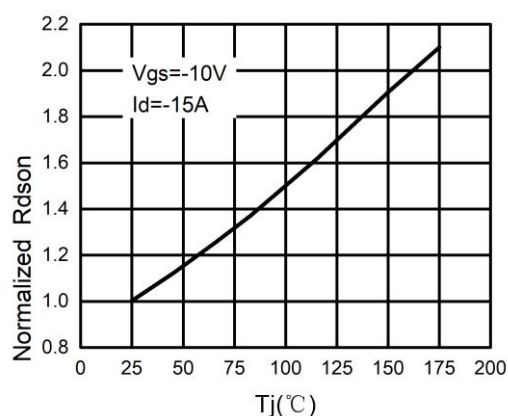


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

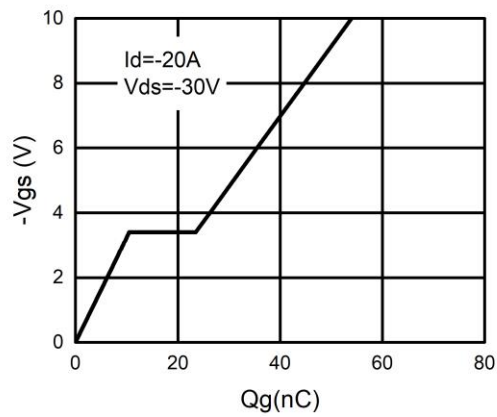


Figure 7. Gate Charge Waveforms

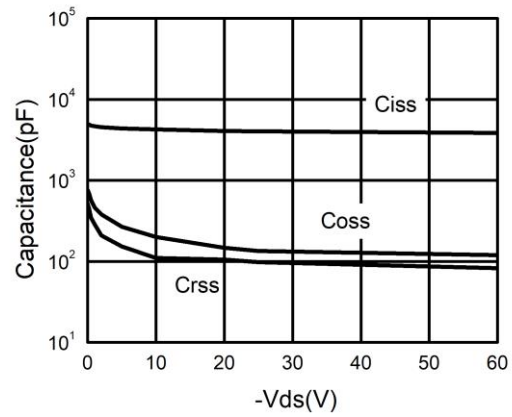


Figure 8. Capacitance

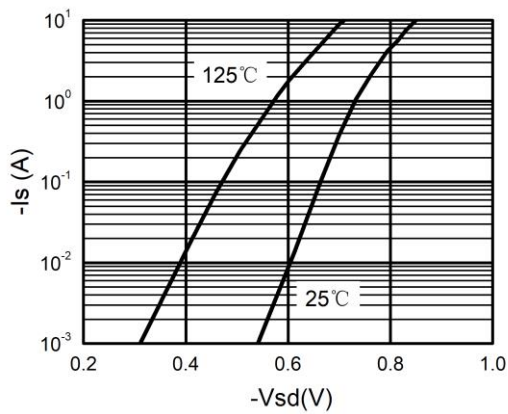


Figure 9. Body-Diode Characteristics

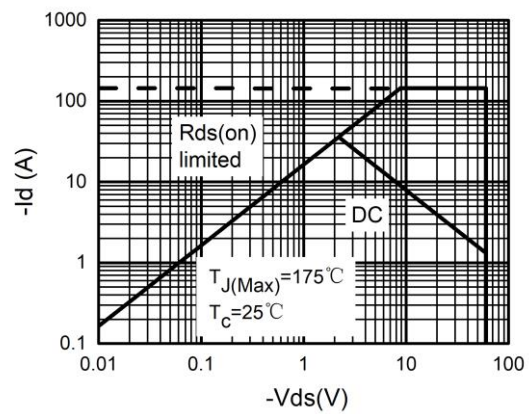
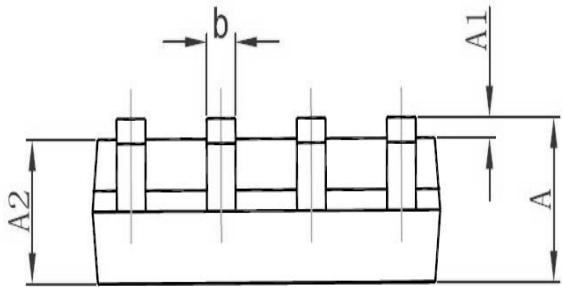
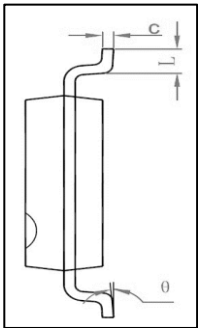
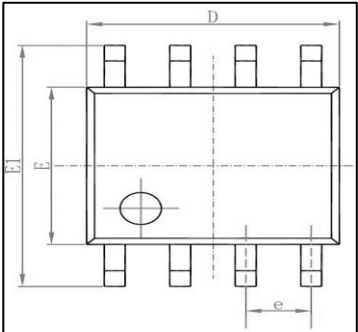
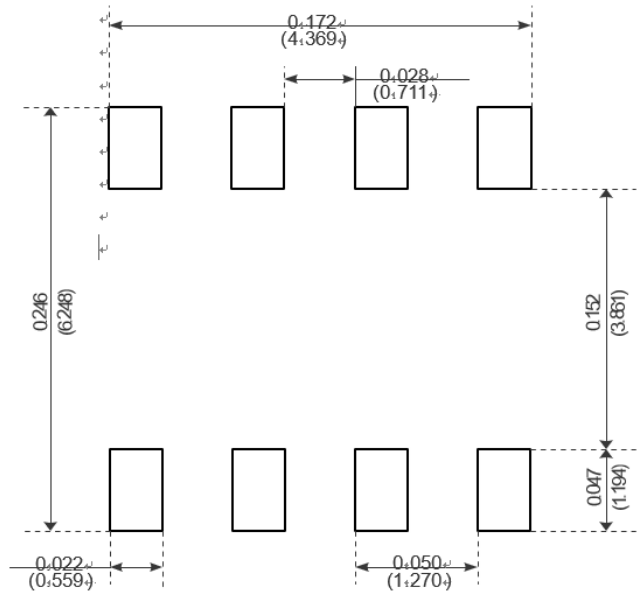


Figure 10. Maximum Safe Operating Area

Package Mechanical Data:SOP-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Recommended Minimum Pads