40V P-Channel Mosfet

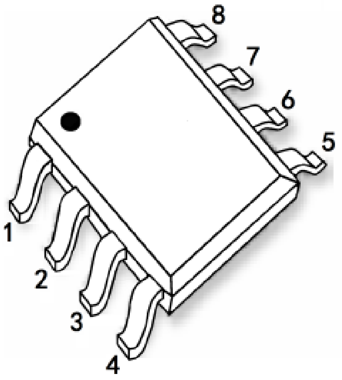
FEATURES

- $R_{DS(ON)}$=20mΩ(Typ.) @V_{GS}=20V, I_D=7.5A

APPLICATIONS

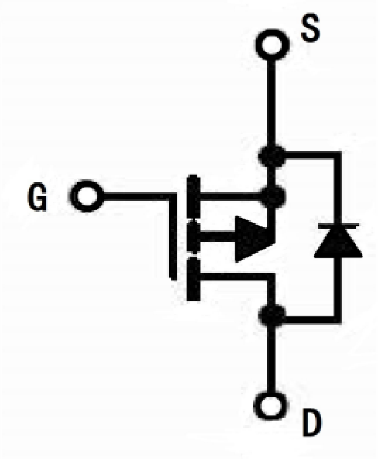
- Battery switching application
- Hard switched and high frequency circuits
- Power management

SOP-8



JST08P40S8

P-CHANNEL MOSFET



MAXIMUM RATINGS TC=25℃ unless otherwise specified

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	-40	V
I_D	Continuous Drain Current	-7.5	A
I_{DM}	Pulsed Drain Current	-24	A
V_{GSS}	Gate-Source Voltage	±20	V
P_D	Power Dissipation	3	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	150，–55 to 150	℃
T_L	Maximum Temperature for Soldering	300	℃

ELECTRICAL CHARACTERISTICS Tc= 25℃ unless otherwise specified :

OFF Characteristics

Symbol	Param	Test Condition	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-40	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS} = -40V, V_{GS}= 0V	--	--	-1	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =+20V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =-20V	--	--	-100	nA

ON Characteristics

Symbol	Param	Test Condition	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=-10V, I_D=-5A	--	20	28	mΩ
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=-4.5V, I_D=-5A	--	26	40	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1.2	-1.65	-2.3	V

Dynamic Characteristics

Symbol	Param	Test Condition	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=-5V, I_D =-5A	20	--	--	S
C_{iss}	Input Capacitance	V_{GS} = 0V	--	1450	--	pF
C_{oss}	Output Capacitance	V_{DS} = -20V	--	180	--	pF
C_{rss}	Reverse Transfer Capacitance	f = 1.0MHz	--	150	--	pF

Resistive Switching Characteristics

Symbol	Param	Test Condition	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =-5A V_{DS} = -20V V_{GS} = 10V R_G = 3.0Ω	--	8	--	ns
t_r	Rise Time		--	7	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	25	--	
t_f	Fall Time		--	9	--	
Q_g	Total Gate Charge	I_D =-5A V_{DS} = -20V V_{GS} = -10V	--	24	--	nC
Q_{gs}	Gate to Source Charge		--	3.5	--	
Q_{gd}	Gate to Drain (“Miller”) Charge		--	6	--	

Source-Drain Diode Characteristics

Symbol	Param	Test Condition	Rating			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current		--	--	-7.5	A
V_{SD}	Diode Forward Voltage	I_S=-6A, V_{GS}=0V	--	--	-1.2	V

Symbol	Param	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient	50	℃/W

TYPICAL PERFORMANCE CHARACTERISTICS

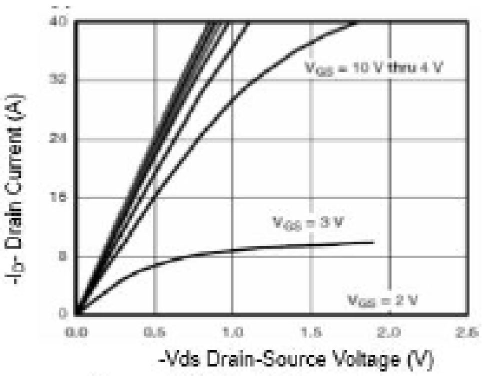


Figure 1 Output Characteristics

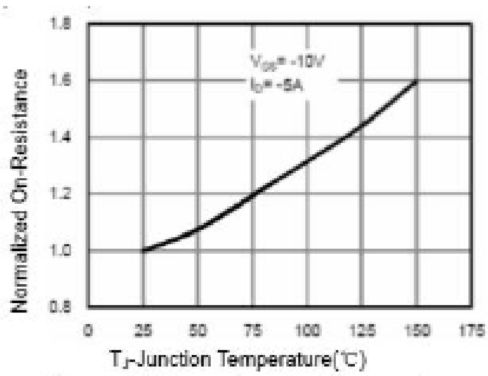


Figure 4 Rdson-Junction Temperature

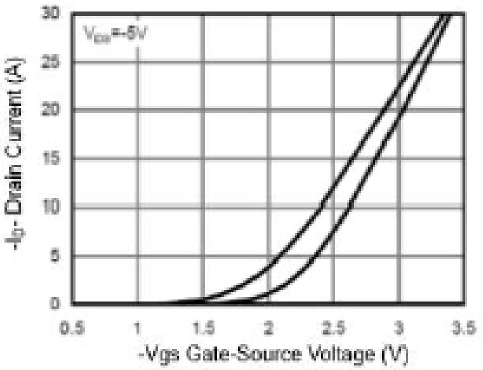


Figure 2 Transfer Characteristics

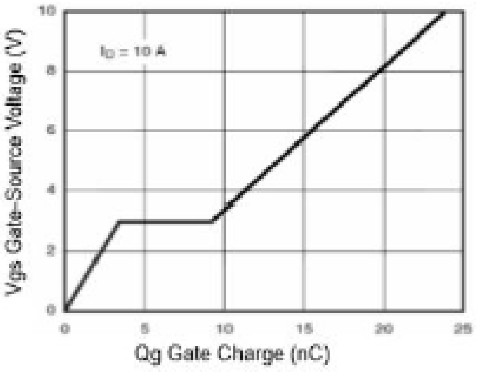


Figure 5 Gate Charge

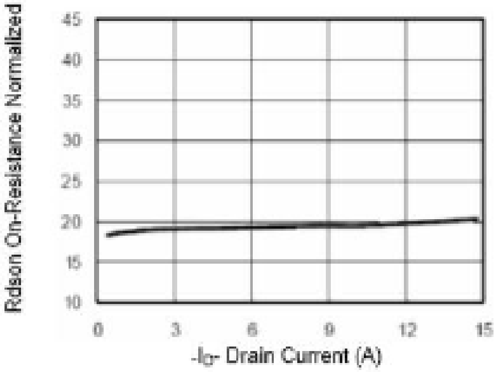


Figure 3 Rdson- Drain Current

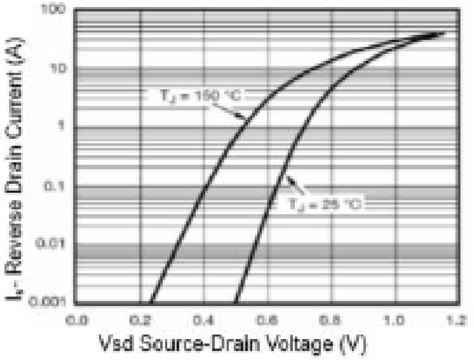


Figure 6 Source- Drain Diode Forward

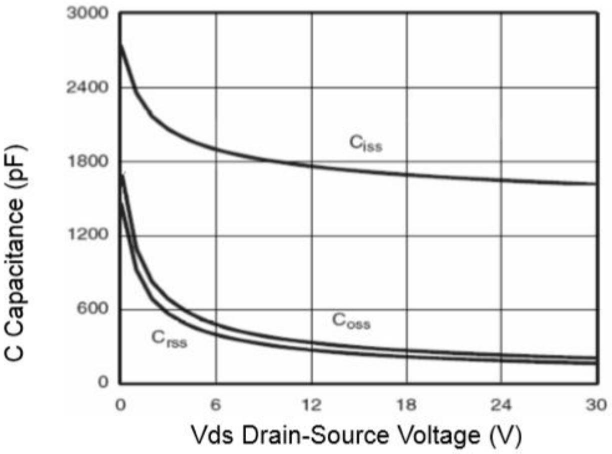


Figure 7 Capacitance vs Vds

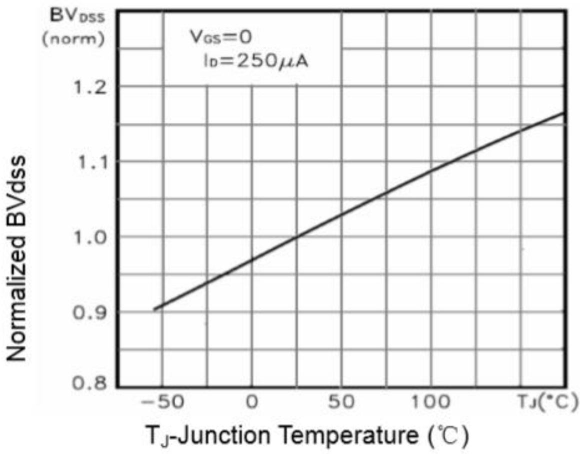


Figure 9 BV_{DSS} vs Junction Temperature

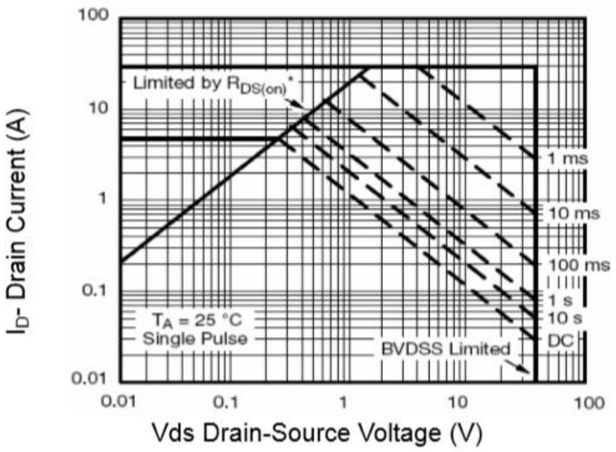


Figure 8 Safe Operation Area

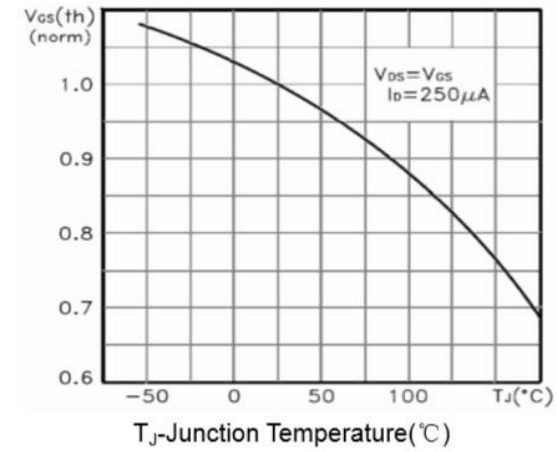


Figure 10 $V_{GS(th)}$ vs Junction Temperature

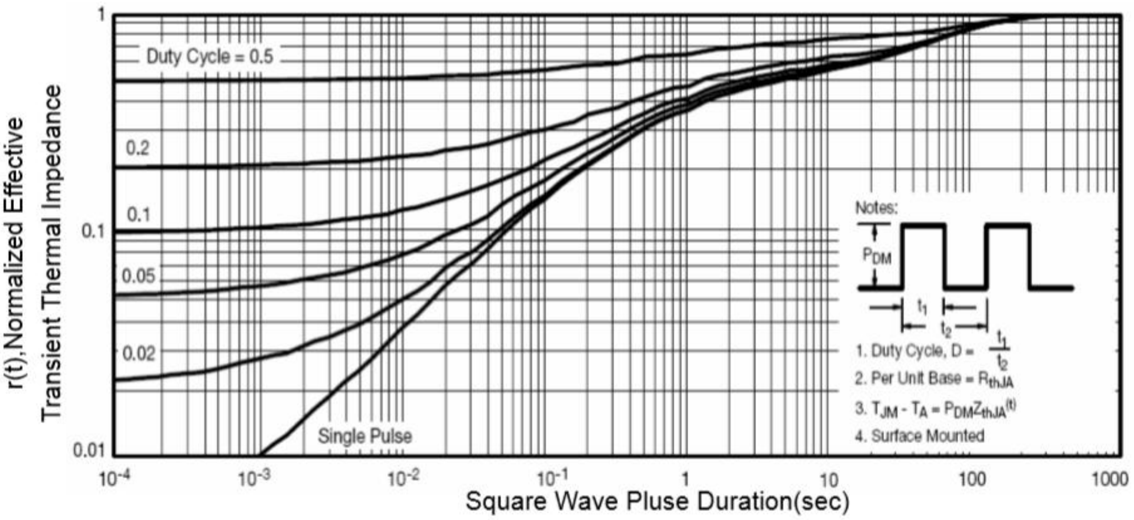
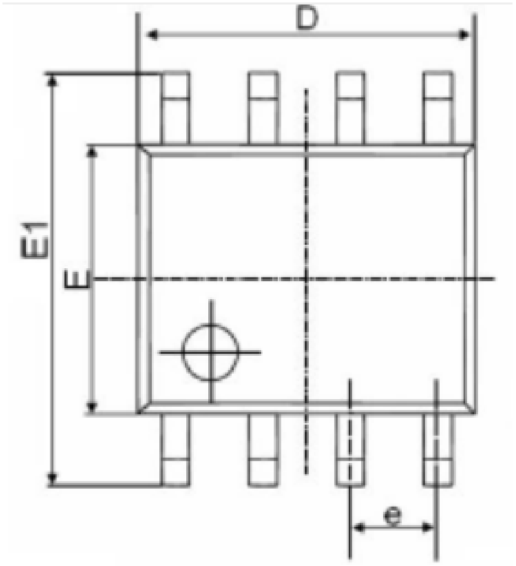
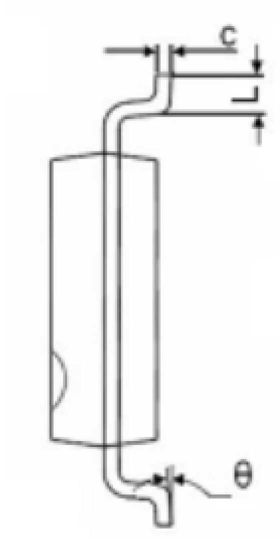
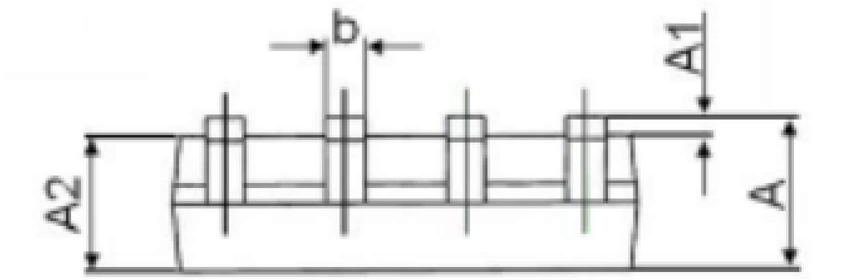


Figure 11 Normalized Maximum Transient Thermal Impedance

SOP-8 PACKAGE OUTLINE DRAWING







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.063	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.063	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	1.27(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°