S9MPB016

20V Dual P-Channel MOSFETs

General Description

The S9MPB016 is the Dual P-Channel logic enhancement mode power field effect transistor is produced using high cell density, DMOS trench technology.

This high-density process is especially tailored to minimize on-state resistance.

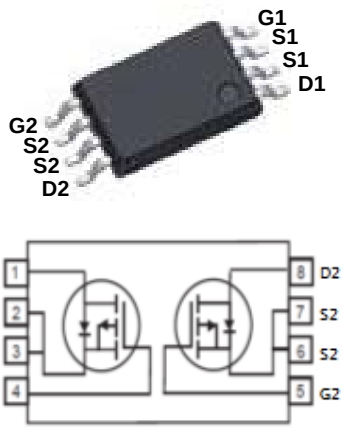
These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other Battery powered circuits, and low in-line power loss are needed in a very small outline surface mount package.

BV_{DSS}	$R_{DS(ON)}$	I_D
-20 V	16 mΩ	-11 A

Features

- -20V, -11A, $R_{DS(ON)}$=16mΩ@V_{GS}= -4.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

TSSOP-8 Pin Configuration



Applications

- POWER Management in Note
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC

Absolute Maximum Ratings T_A=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current - Continuous (T_A=25°C)	-11	A
	Drain Current - Continuous (T_A=100°C)	-7	A
I_{DM}	Drain Current - Pulsed	-44	A
P_D	Power Dissipation	1.25	W
T_J	Operating Junction Temperature Range	-50 to 150	°C
T_{STG}	Storage Temperature Range	-50 to 150	°C
Marking Code		PB016	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	100	°C/W

Electrical Characteristics (T_A=25°C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}= 0V , I_D= -250uA	-20	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}= -20V , V_{GS}= 0V	---	---	-1	uA
		V_{DS}= -16V , V_{GS}= 0V , T_J=125°C	---	---	-10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±12V , V_{DS}= 0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}= -4.5V , I_D= -6A	---	12	16	mΩ
		V_{GS}= -2.5V , I_D= -4A	---	16	22	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D= -250uA	-0.3	-0.6	-1	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}= -10V , V_{GS}= -4.5V , I_D= -6A	---	27	40	nC
Q_{gs}	Gate-Source Charge		---	2.4	4.8	
Q_{gd}	Gate-Drain Charge		---	5.3	8	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}= -10V , V_{GEN}= -4.5V , R_G= 25Ω , I_D= -1A	---	16.2	31	nS
T_r	Rise Time		---	43.5	83	
$T_{d(off)}$	Turn-Off Delay Time		---	114	217	
T_f	Fall Time		---	28.8	55	
C_{iss}	Input Capacitance	V_{DS}= -15V , V_{GS}= 0V , F= 1MHz	---	2320	3370	pF
C_{oss}	Output Capacitance		---	280	410	
C_{rss}	Reverse Transfer Capacitance		---	175	260	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage	V_{GS}= 0V , I_S= -1A	---	---	-1	V

Characteristics Curves

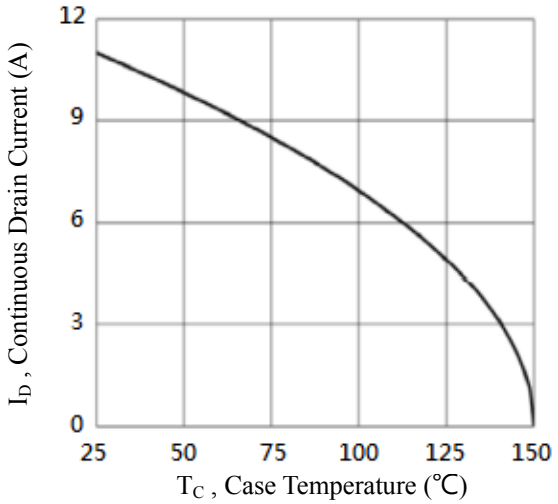


Fig.1 Continuous Drain Current vs. T_C

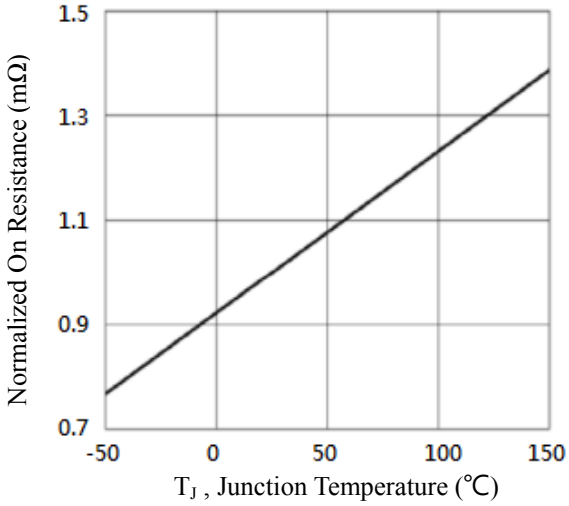


Fig.2 Normalized RDSON vs. T_J

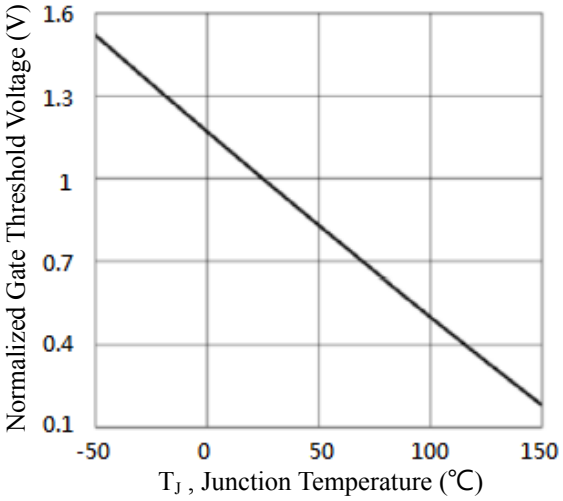


Fig.3 Normalized V_{th} vs. T_J

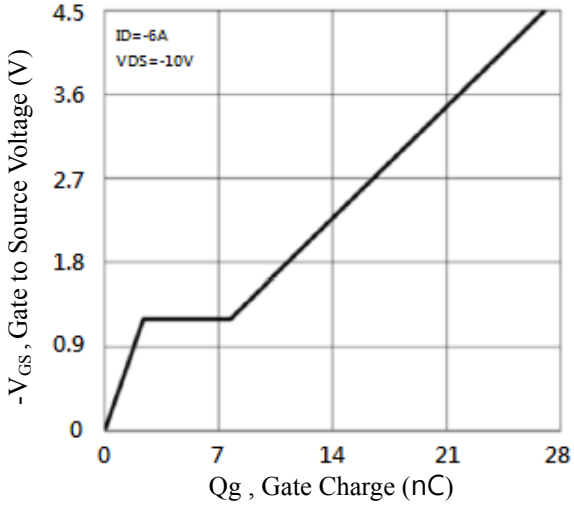


Fig.4 Gate Charge Waveform

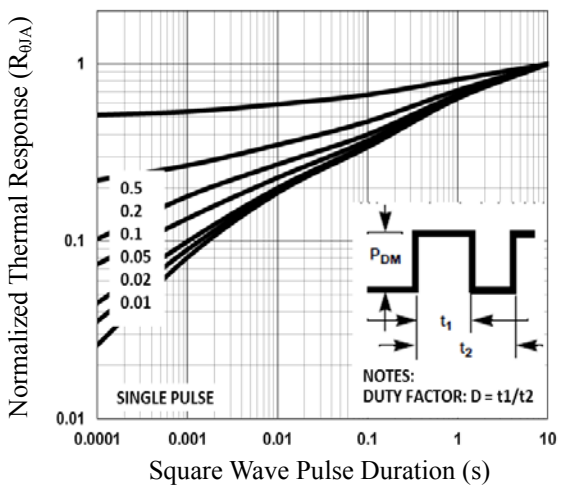


Fig.5 Normalized Transient Response

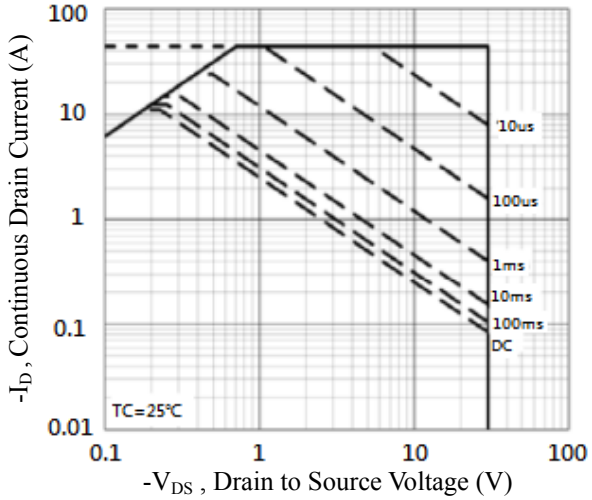


Fig.6 Maximum Safe Operation Area

Characteristics Curves

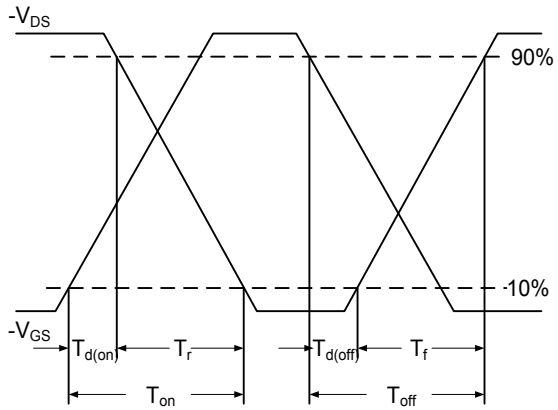


Fig.7 Switching Time Waveform

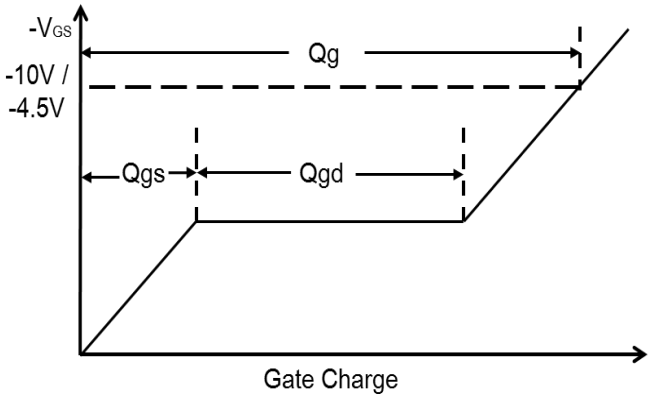
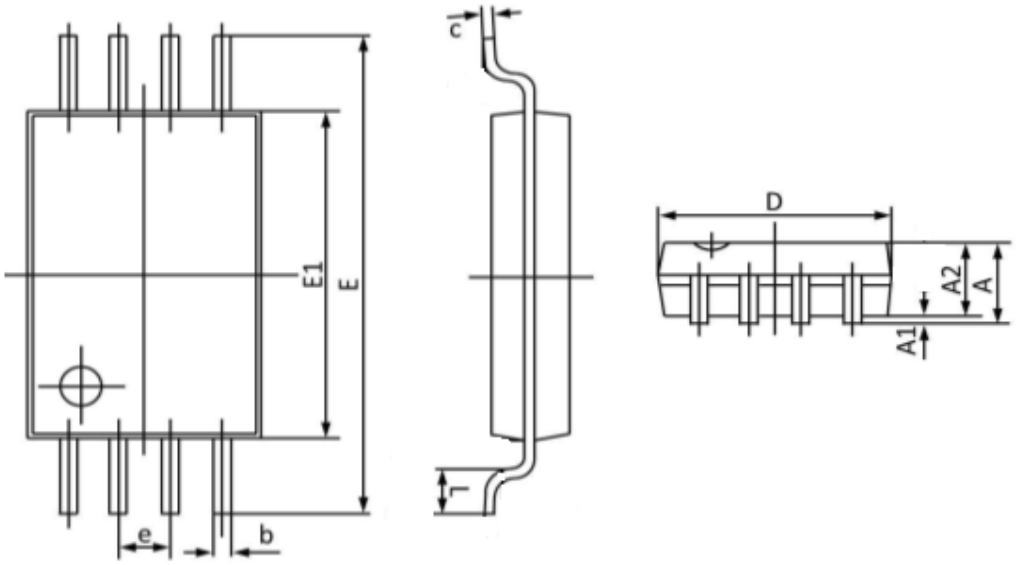


Fig.8 Gate Charge Waveform

Package Outline Dimensions

TSSOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	-	1.200	-	0.047
A1	0.020	0.150	0.001	0.006
A2	0.800	1.050	0.031	0.041
b	0.190	0.300	0.007	0.011
c	0.090	0.200	0.004	0.008
D	2.900	3.100	0.114	0.122
E	6.200	6.600	0.244	0.260
E1	4.300	4.500	0.169	0.177
e	0.650(BSC)		0.025(BSC)	
L	0.450	0.750	0.018	0.029

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