

AP10N10S

N-Channel Power MOSFET

Product Summary

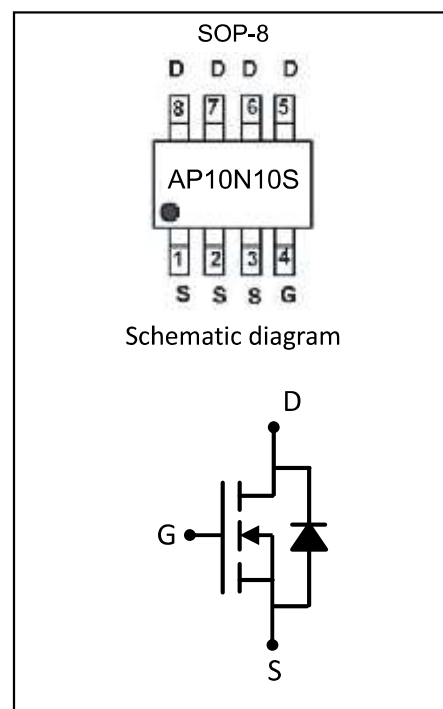
$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	14m Ω @10V	10A
	21m Ω @4.5V	

Feature

- Trench DMOS Power MOSFET
- Fast Switching
- Exceptional on-resistance and maximum DC current capability

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AP10N10S	AP10N10S	SOP-8		-	-

ABSOLUTE MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	+20/-12	V
Continuous Drain Current	I_D	10	A
Power Dissipation	P_D	3.1	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	40	$^{\circ}\text{C/W}$
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}\text{C}$

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MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	100			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = +20V/-12V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage ⁽¹⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.5	2.5	V
Drain-source on-resistance ⁽¹⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$		12	14	m Ω
		$V_{GS} = 4.5V, I_D = 10A$		18	21	
Forward transconductance ⁽¹⁾	g_{FS}	$V_{DS} = 10V, I_D = 10A$		10		S
Dynamic characteristics⁽²⁾						
Input Capacitance	C_{iss}	$V_{DS} = 50V, V_{GS} = 0V, f = 1MHz$		1640		pF
Output Capacitance	C_{oss}			240		
Reverse Transfer Capacitance	C_{rss}			4		
Switching characteristics⁽²⁾						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 50V, I_D = 1A, R_L = 6\Omega$ $V_{GS} = 10V, R_G = 1\Omega$		14.2		ns
Turn-on rise time	t_r			20.8		
Turn-off delay time	$t_{d(off)}$			42		
Turn-off fall time	t_f			30		
Total Gate Charge	Q_g	$V_{DS} = 50V, I_D = 10A,$ $V_{GS} = 10V$		27.8		nC
Gate-Source Charge	Q_{gs}			3.5		
Gate-Drain Charge	Q_{gd}			8.8		
Source-Drain Diode characteristics						
Diode Forward voltage ⁽¹⁾	V_{DS}	$V_{GS} = 0V, I_S = 1A$			1	V

Notes:

1. Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

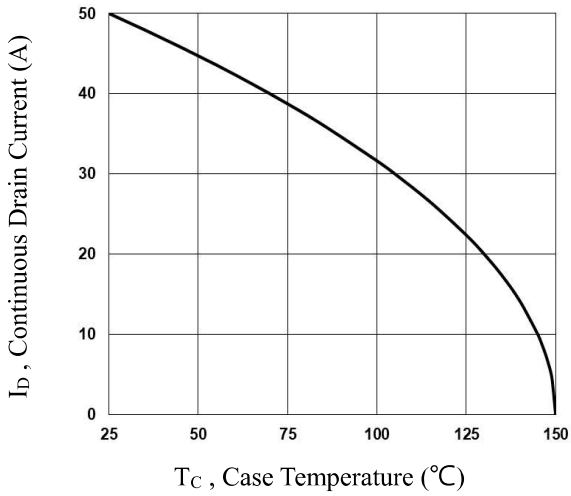


Fig.1 Continuous Drain Current vs. T_C

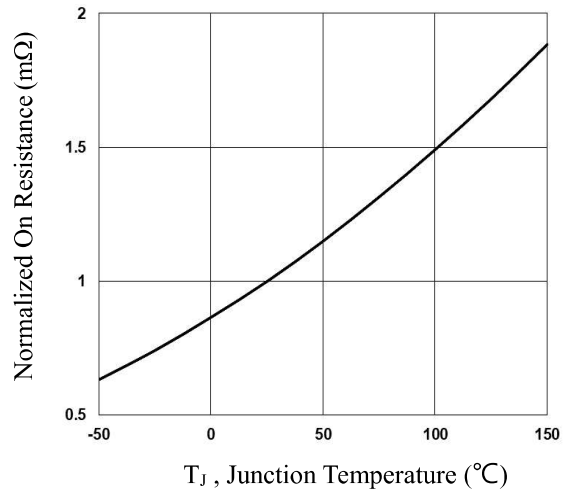


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

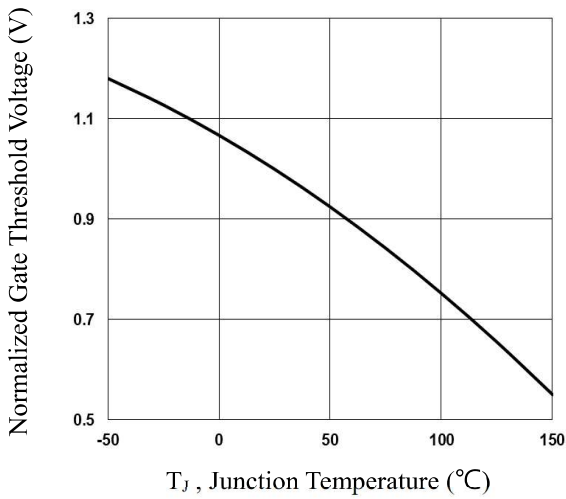


Fig.3 Normalized V_{th} vs. T_J

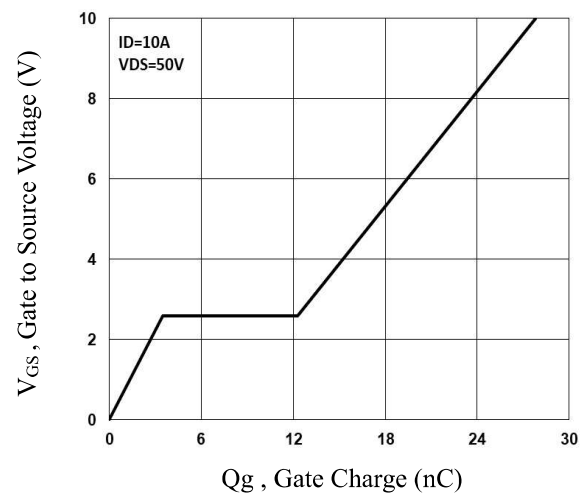


Fig.4 Gate Charge Characteristics

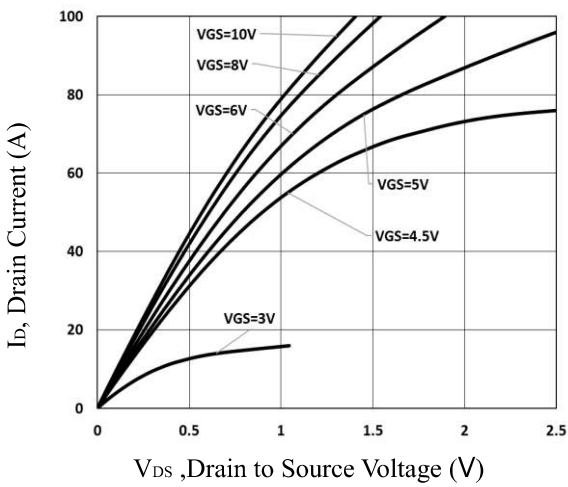


Fig.5 Typical Output Characteristics

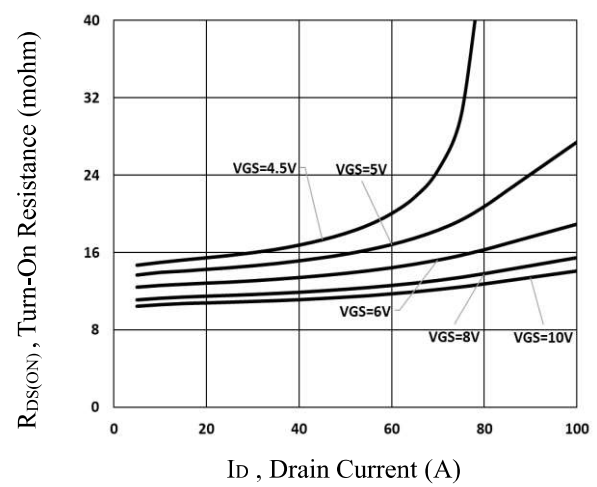


Fig.6 Turn-On Resistance vs. I_D

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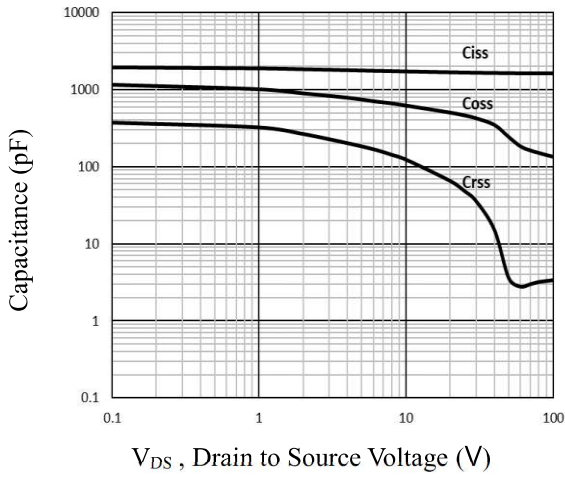


Fig.7 Capacitance Characteristics

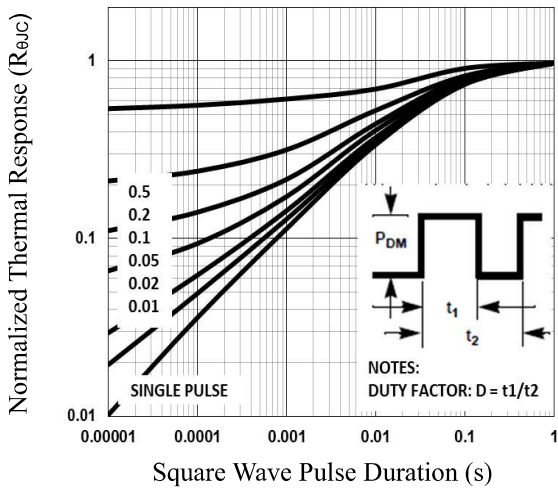


Fig.8 Normalized Transient Impedance

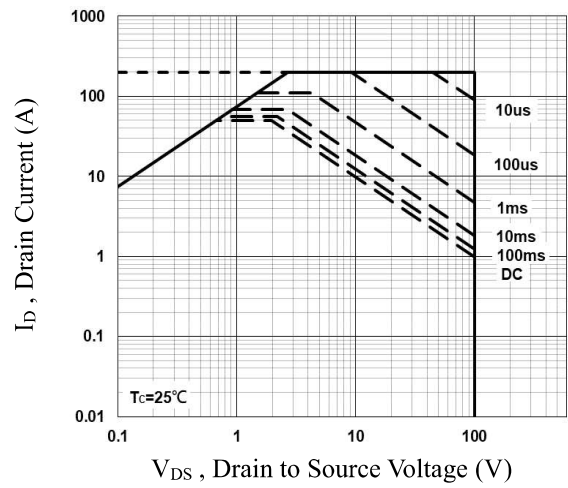


Fig.9 Maximum Safe Operation Area

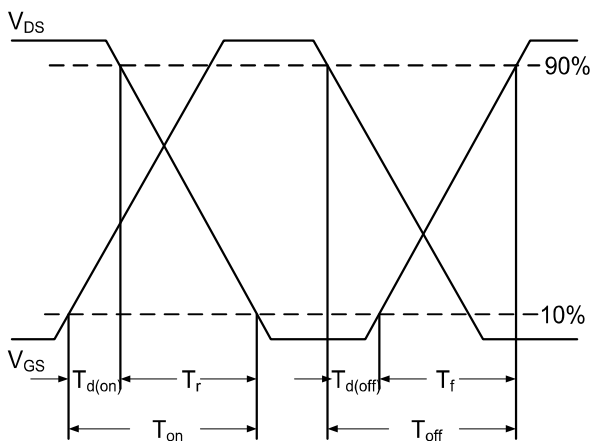


Fig.10 Switching Time Waveform

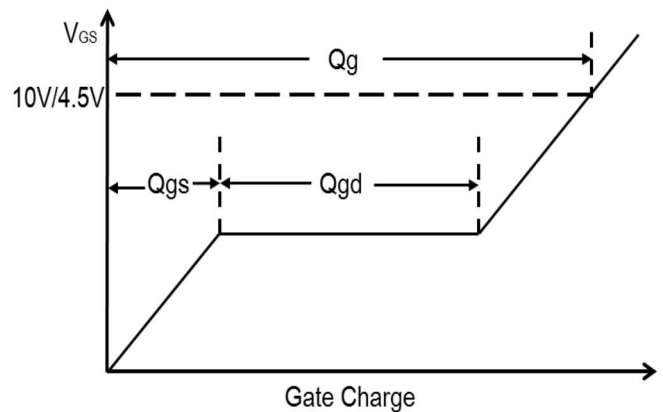


Fig.11 Gate Charge Waveform

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SOP-8 Package Information

