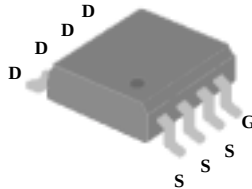




- ▼ Simple Drive Requirement
- ▼ Low On-resistance
- ▼ Fast Switching Characteristic



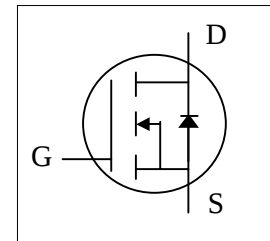
Exposed pad SO-8
(Drain contact on the Backside)

BV_{DSS}	30V
$R_{DS(ON)}$	18m Ω
I_D	10.3A

Description

The Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The exposed pad SO-8 package provides the backside heat sink (Drain) to release thermal and reduce the package temperature and is good for low voltage applications such as high current DC/DC converters.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A = 25^\circ\text{C}$	Continuous Drain Current ³	10.3	A
$I_D @ T_A = 70^\circ\text{C}$	Continuous Drain Current ³	8.2	A
I_{DM}	Pulsed Drain Current ¹	50	A
$P_D @ T_A = 25^\circ\text{C}$	Total Power Dissipation	3	W
	Linear Derating Factor	0.02	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-case Max.	3.6	$^\circ\text{C}/\text{W}$
Rthj-a	Thermal Resistance Junction-ambient ³ Max.	42	$^\circ\text{C}/\text{W}$



AP9406MP

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	-	-	V
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.02	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =9A	-	-	18	mΩ
		V _{GS} =4.5V, I _D =7A	-	-	25	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	-	3	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =9A	-	15	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =30V, V _{GS} =0V	-	-	1	uA
	Drain-Source Leakage Current (T _j =70°C)	V _{DS} =24V, V _{GS} =0V	-	-	25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±20V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D =9A	-	8	13	nC
Q _{gs}	Gate-Source Charge	V _{DS} =24V	-	2	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	4	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =15V	-	7	-	ns
t _r	Rise Time	I _D =1A	-	6	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =10V	-	19	-	ns
t _f	Fall Time	R _D =15Ω	-	7	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	620	1530	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	230	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	90	-	pF
R _g	Gate Resistance	f=1.0MHz	-	3.2	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =2.5A, V _{GS} =0V	-	-	1.2	V
t _{rr}	Reverse Recovery Time ²	I _S =9A, V _{GS} =0V,	-	24	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	16	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse width ≤300us , duty cycle ≤2%.
- 3.Surface mounted on 1 in² copper pad of FR4 board, t ≤10sec ; 115 °C/W when mounted on Min. copper pad.

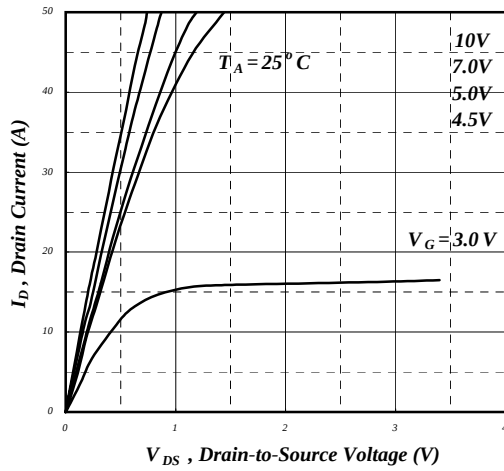


Fig 1. Typical Output Characteristics

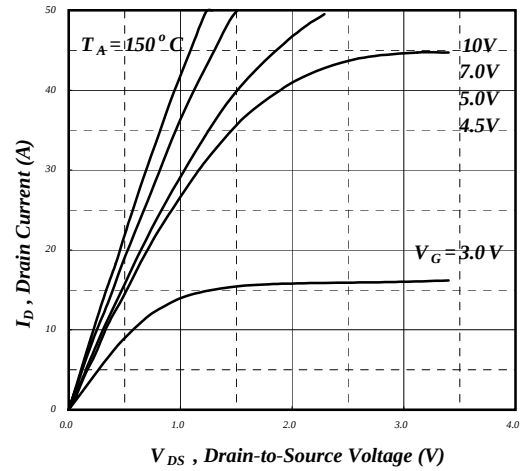


Fig 2. Typical Output Characteristics

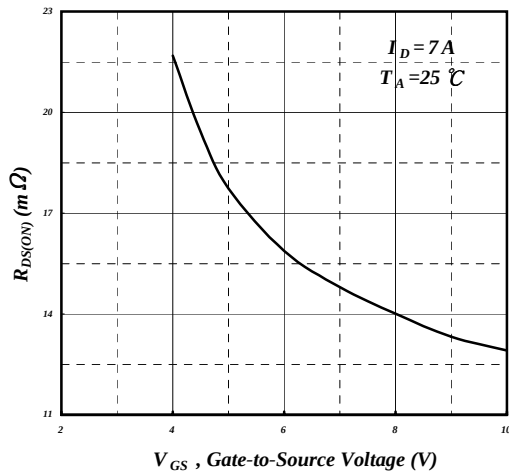


Fig 3. On-Resistance v.s. Gate Voltage

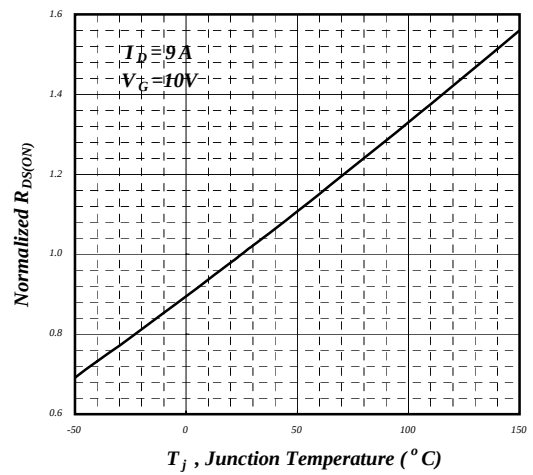


Fig 4. Normalized On-Resistance v.s. Junction Temperature

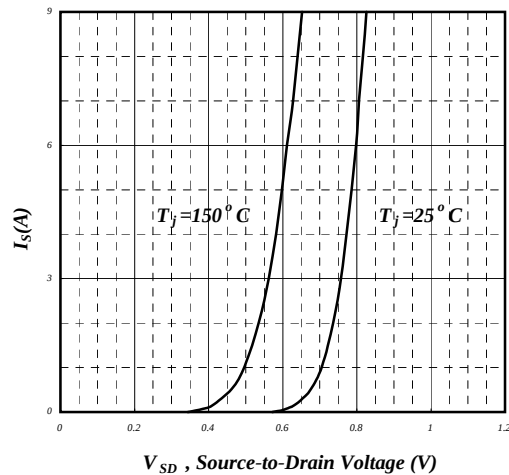


Fig 5. Forward Characteristic of Reverse Diode

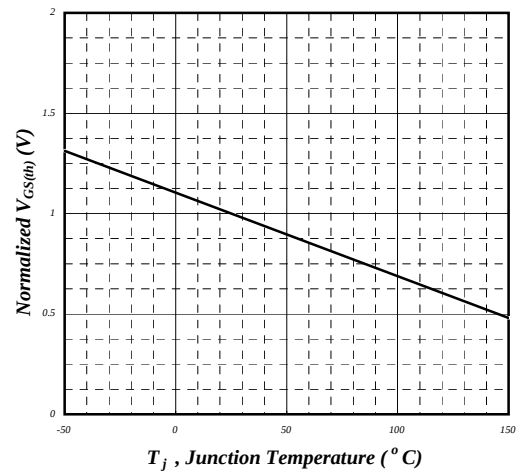


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

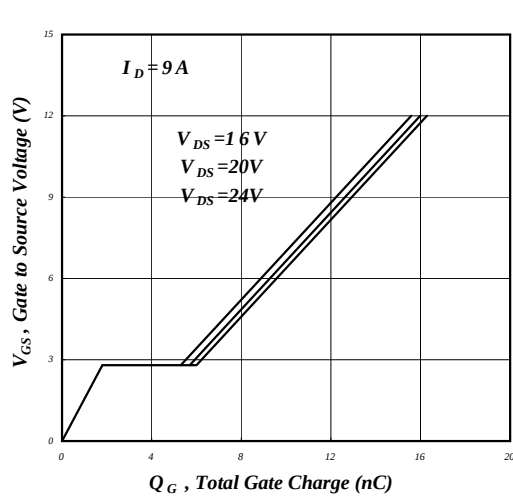


Fig 7. Gate Charge Characteristics

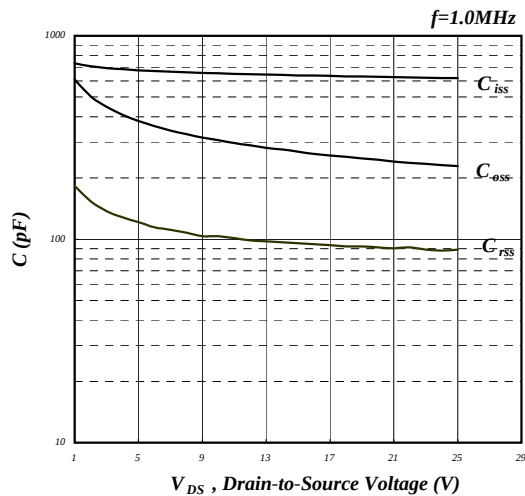


Fig 8. Typical Capacitance Characteristics

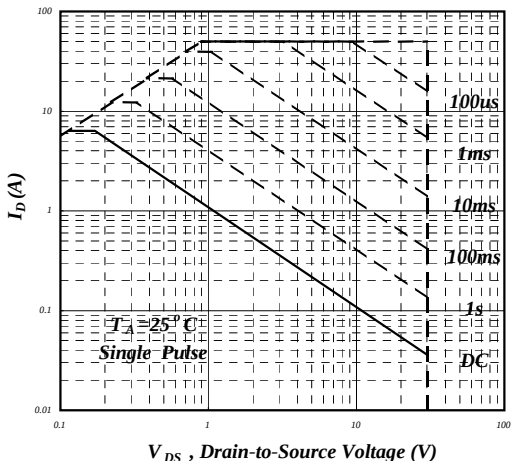


Fig 9. Maximum Safe Operating Area

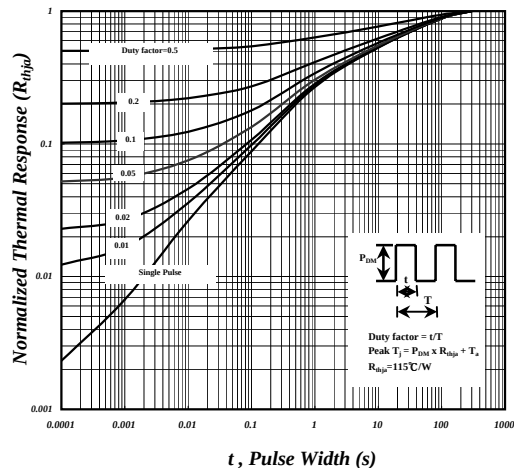


Fig 10. Effective Transient Thermal Impedance

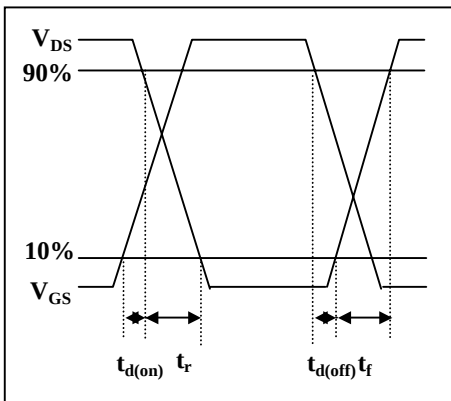


Fig 11. Switching Time Waveform

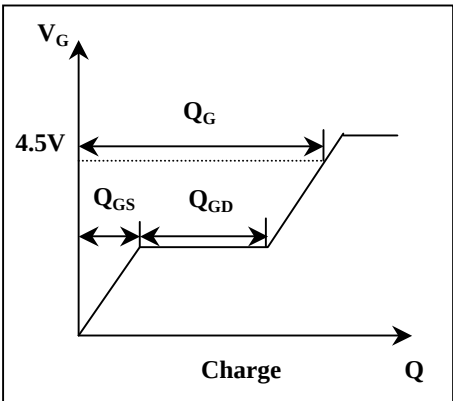


Fig 12. Gate Charge Waveform