

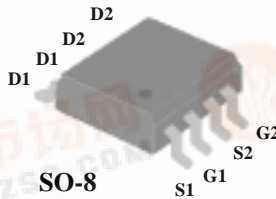


**Advanced Power  
Electronics Corp.**

**AP9926EM-A**

*N-CHANNEL ENHANCEMENT MODE  
POWER MOSFET*

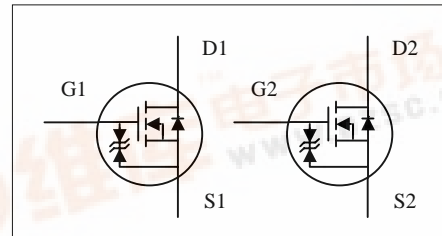
- ▼ Low on-resistance
- ▼ Capable of 2.5V gate drive
- ▼ Surface mount package



$BV_{DSS}$	16V
$R_{DS(ON)}$	27m $\Omega$
$I_D$	7A

**Description**

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



**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	16	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D@T_A=25^\circ C$	Continuous Drain Current <sup>3</sup>	7	A
$I_D@T_A=70^\circ C$	Continuous Drain Current <sup>3</sup>	5.6	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	20	A
$P_D@T_A=25^\circ C$	Total Power Dissipation	2	W
	Linear Derating Factor	0.016	W/ $^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

**Thermal Data**

Symbol	Parameter	Value	Unit
Rthj-a	Thermal Resistance Junction-ambient <sup>3</sup>	Max. 62.5	$^\circ C/W$



## AP9926EM-A

### Electrical Characteristics @T<sub>j</sub>=25°C (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	16	-	-	V
ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	-	0.01	-	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A	-	-	27	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =5A	-	-	40	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	-	-	1.2	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =6A	-	13	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current (T <sub>j</sub> =25°C)	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V	-	-	1	uA
	Drain-Source Leakage Current (T <sub>j</sub> =70°C)	V <sub>DS</sub> =12V, V <sub>GS</sub> =0V	-	-	25	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±12V	-	-	±10	uA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =6A	-	14	22	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =10V	-	1.4	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =4.5V	-	7	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =10V	-	10	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =1A	-	13	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω, V <sub>GS</sub> =10V	-	26	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =10Ω	-	8	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	420	670	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =16V	-	280	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	120	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	3	-	Ω

### Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =1.7A, V <sub>GS</sub> =0V	-	-	1.2	V

#### 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; 135 °C/W when mounted on Min. copper pad.

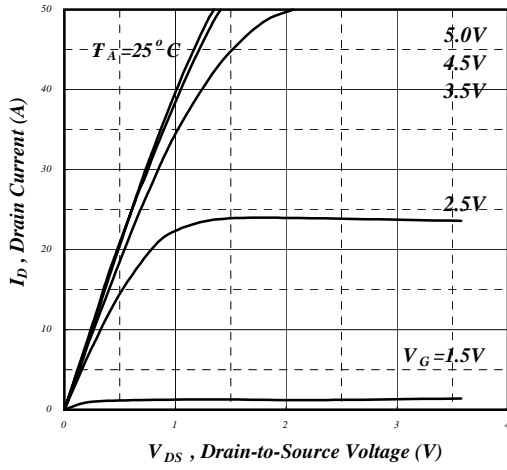


Fig 1. Typical Output Characteristics

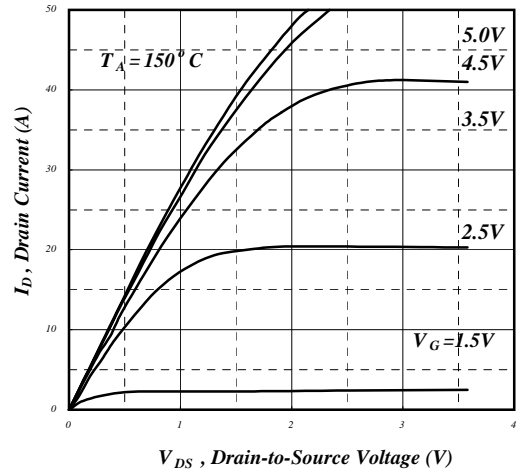


Fig 2. Typical Output Characteristics

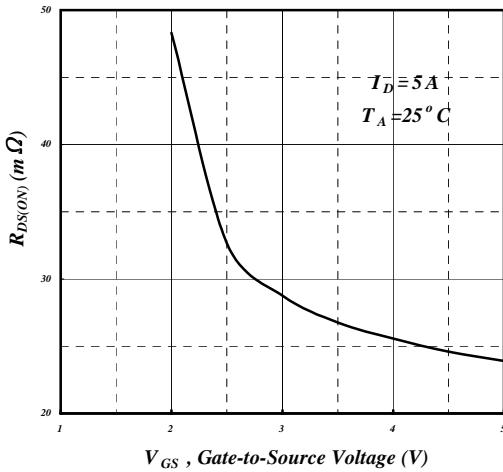


Fig 3. On-Resistance v.s. Gate Voltage

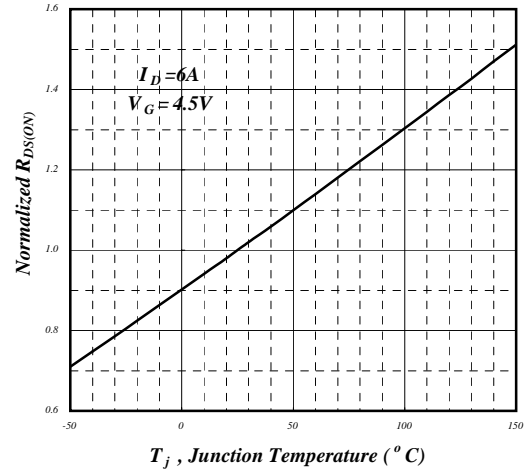


Fig 4. Normalized On-Resistance v.s. Temperature

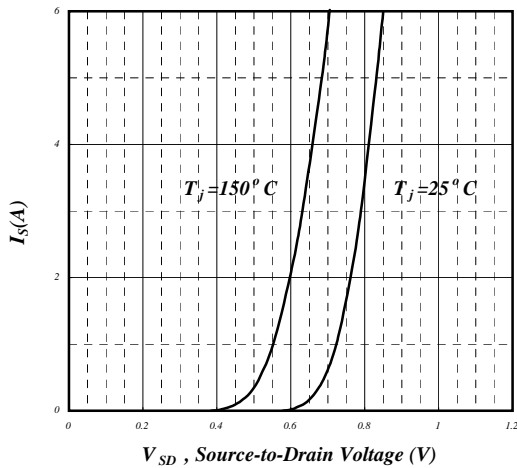


Fig 5. Forward Characteristic of Reverse Diode

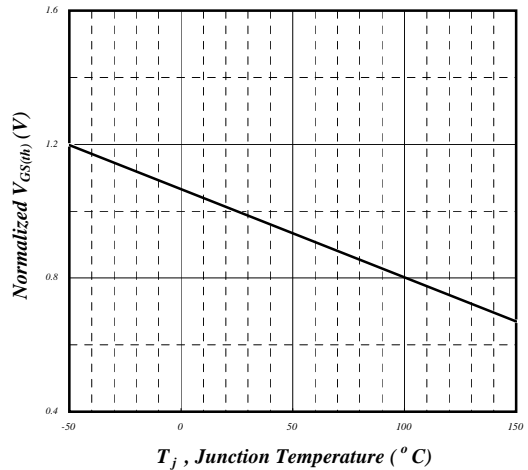


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

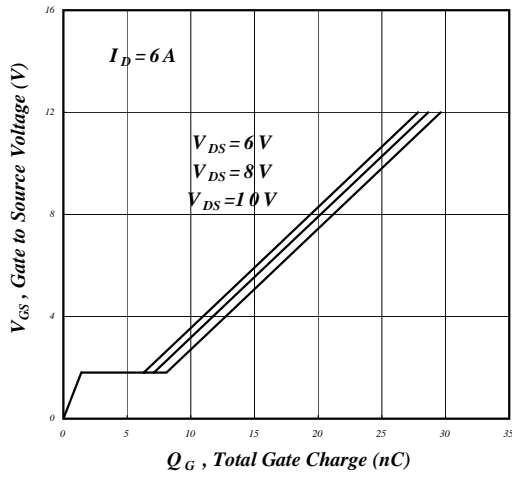


Fig 7. Gate Charge Characteristics

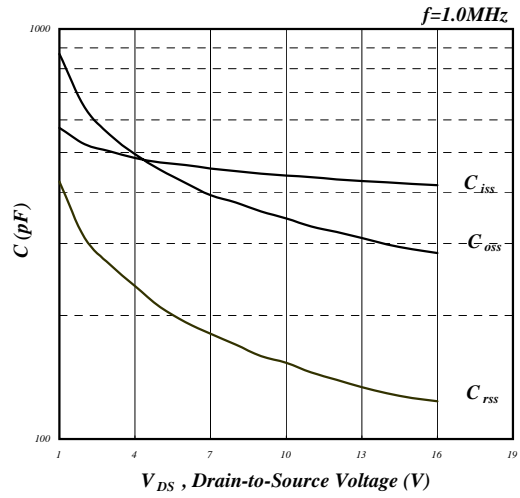


Fig 8. Typical Capacitance Characteristics

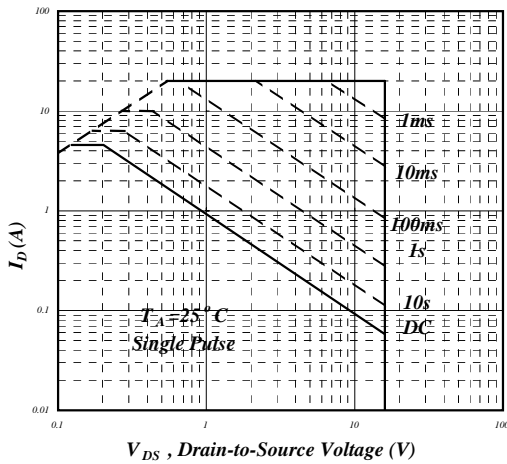


Fig 9. Maximum Safe Operating Area

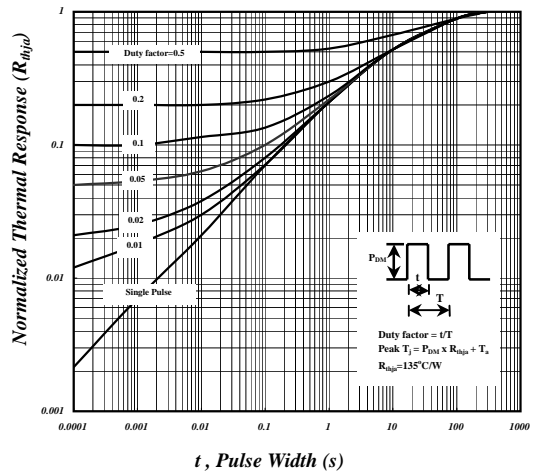


Fig 10. Effective Transient Thermal Impedance

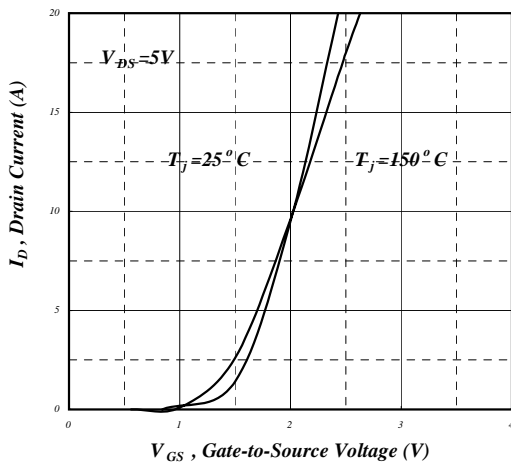


Fig 11. Transfer Characteristics

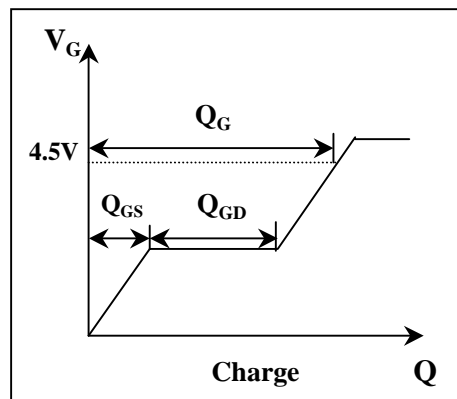


Fig 12. Gate Charge Waveform