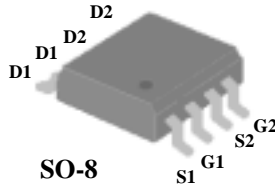




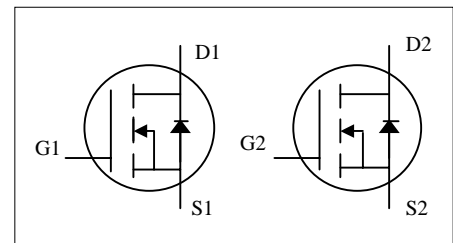
- ▼ DC-DC Application
- ▼ Dual N-channel Device
- ▼ Surface Mount Package



BV_{DSS}	30V
$R_{DS(ON)}$	50m Ω
I_D	5A

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	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A=25^\circ C$	Continuous Drain Current ³	5	A
$I_D @ T_A=70^\circ C$	Continuous Drain Current ³	4	A
I_{DM}	Pulsed Drain Current ¹	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 ³	Max. 62.5	$^\circ C/W$



AP9936GM

Electrical Characteristics @ $T_j=25^{\circ}\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to $25^{\circ}\text{C}, I_D=1\text{mA}$	-	0.037	-	$V/^{\circ}\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=5A$	-	-	50	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=3.9A$	-	-	80	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	3	V
g_{fs}	Forward Transconductance	$V_{DS}=15V, I_D=5A$	-	6	-	S
I_{DSS}	Drain-Source Leakage Current ($T_j=25^{\circ}\text{C}$)	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
	Drain-Source Leakage Current ($T_j=70^{\circ}\text{C}$)	$V_{DS}=24V, V_{GS}=0V$	-	-	25	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V$	-	-	± 100	nA
Q_g	Total Gate Charge ²	$I_D=5A$	-	6.1	-	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=15V$	-	1.4	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=5V$	-	3.3	-	nC
$t_{d(on)}$	Turn-on Delay Time ²	$V_{DS}=15V$	-	6.7	-	ns
t_r	Rise Time	$I_D=1.5A$	-	6.4	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega, V_{GS}=10V$	-	22.1	-	ns
t_f	Fall Time	$R_D=10\Omega$	-	2.1	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	240	-	pF
C_{oss}	Output Capacitance	$V_{DS}=25V$	-	145	-	pF
C_{riss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	55	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Current (Body Diode)	$V_D=V_G=0V, V_S=1.2V$	-	-	1.67	A
V_{SD}	Forward On Voltage ²	$T_j=25^{\circ}\text{C}, I_S=1.7A, V_{GS}=0V$	-	-	1.2	V

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Surface mounted on 1 in^2 copper pad of FR4 board ; $135^{\circ}\text{C}/W$ when mounted on Min. copper pad.

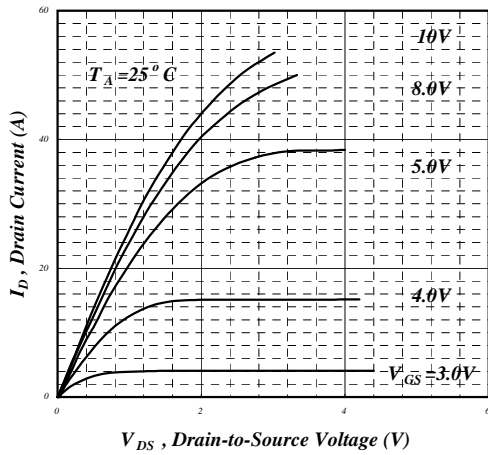


Fig 1. Typical Output Characteristics

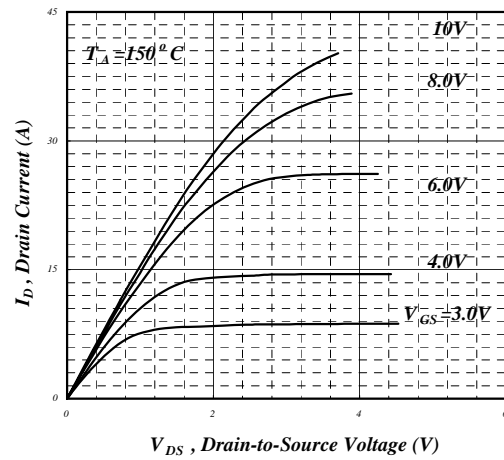


Fig 2. Typical Output Characteristics

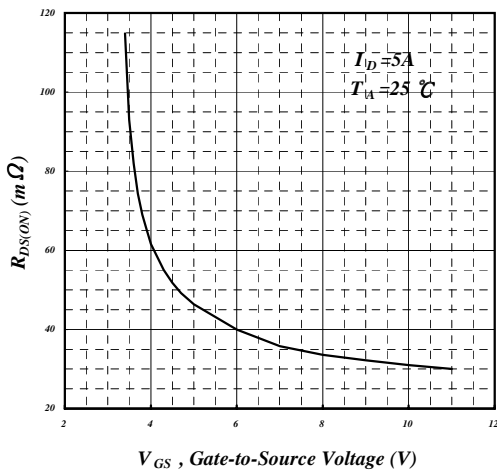


Fig 3. On-Resistance v.s. Gate Voltage

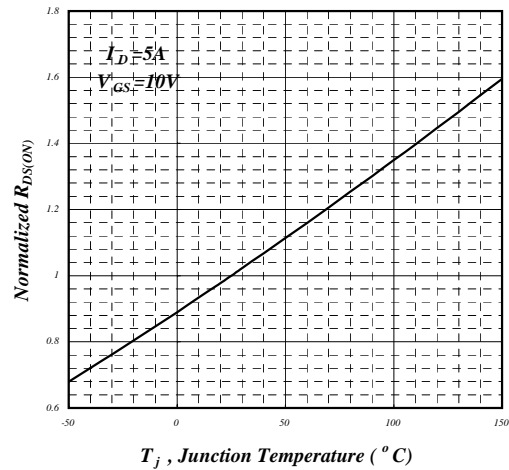


Fig 4. Normalized On-Resistance v.s. Junction Temperature

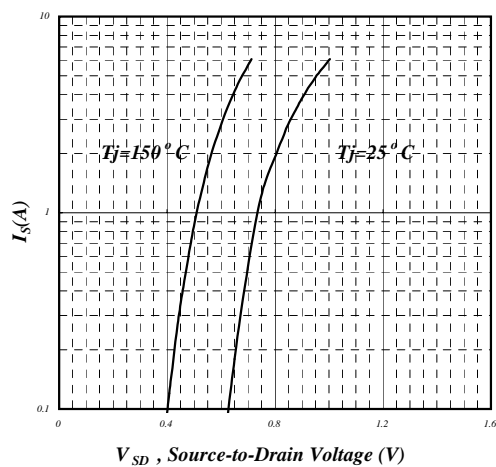


Fig 5. Forward Characteristic of Reverse Diode

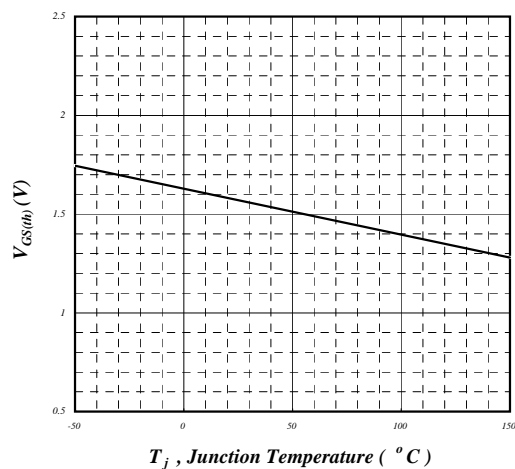


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

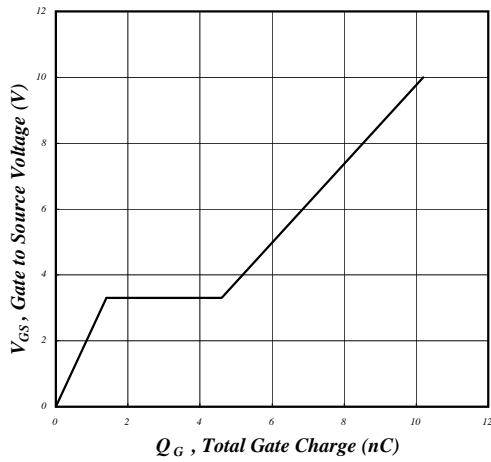


Fig7. Gate Charge Characteristics

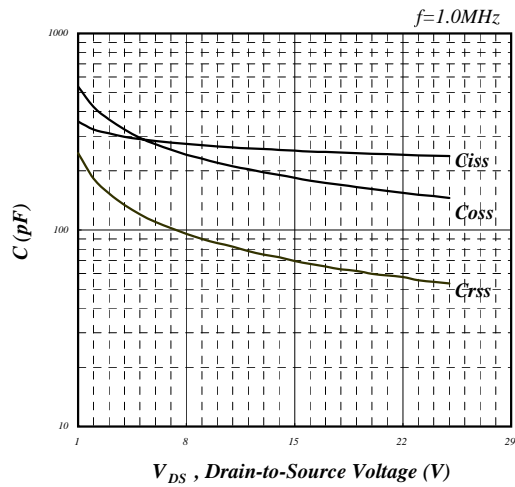


Fig 8 . Typical Capacitance Characteristics

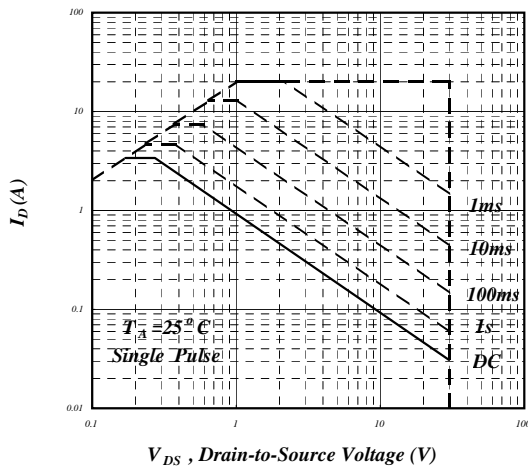


Fig 9. Maximum Safe Operating Area

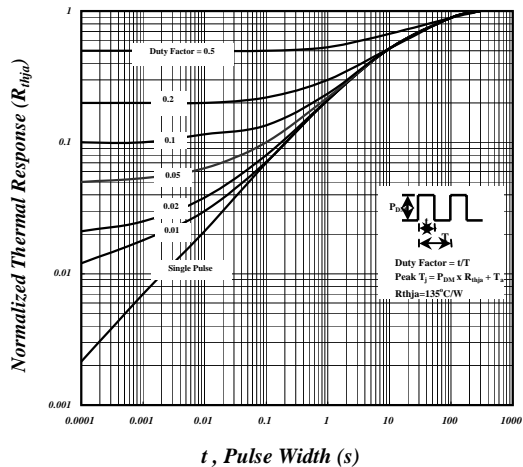


Fig10. Effective Transient Thermal Impedance

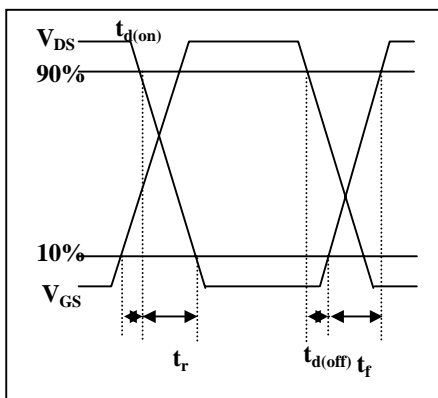


Fig 11. Switching Time Waveform

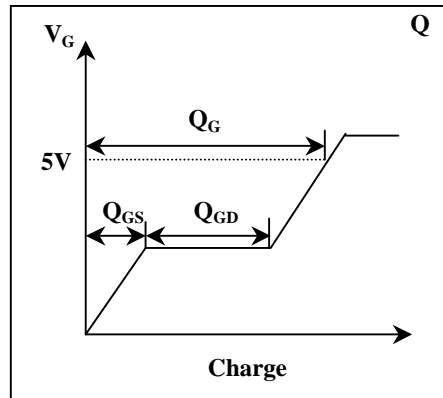


Fig 12. Gate Charge Waveform