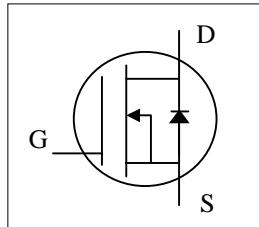




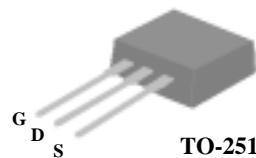
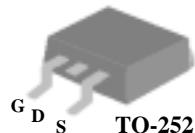
- ▼ Low on-resistance
- ▼ Capable of 2.5V gate drive
- ▼ Low drive current
- ▼ Surface mount package



$BV_{DSS}$	18V
$R_{DS(ON)}$	25mΩ
$I_D$	35A

## 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	18	V
$V_{GS}$	Gate-Source Voltage	± 8	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V$	35	A
$I_D @ T_C = 125^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V$	16	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	90	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	50	W
	Linear Derating Factor	0.4	W/°C
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C

## Thermal Data

Symbol	Parameter	Value	Unit
$R_{thj-c}$	Thermal Resistance Junction-case	Max. 2.5	°C/W
$R_{thj-a}$	Thermal Resistance Junction-ambient	Max. 110	°C/W



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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$\text{BV}_{\text{DSS}}$	Drain-Source Breakdown Voltage	$V_{\text{GS}}=0\text{V}$ , $I_{\text{D}}=250\mu\text{A}$	18	-	-	V
$\Delta \text{BV}_{\text{DSS}}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_{\text{D}}=1\text{mA}$	-	0.03	-	$\text{V}/^\circ\text{C}$
$R_{\text{DS}(\text{ON})}$	Static Drain-Source On-Resistance	$V_{\text{GS}}=4.5\text{V}$ , $I_{\text{D}}=6\text{A}$	-	-	25	$\text{m}\Omega$
		$V_{\text{GS}}=2.5\text{V}$ , $I_{\text{D}}=5.2\text{A}$	-	-	40	$\text{m}\Omega$
$V_{\text{GS}(\text{th})}$	Gate Threshold Voltage	$V_{\text{DS}}=V_{\text{GS}}$ , $I_{\text{D}}=250\mu\text{A}$	0.5	-	1	V
$g_{\text{fs}}$	Forward Transconductance	$V_{\text{DS}}=10\text{V}$ , $I_{\text{D}}=6\text{A}$	-	18	-	S
$I_{\text{DSS}}$	Drain-Source Leakage Current ( $T_j=25^\circ\text{C}$ )	$V_{\text{DS}}=18\text{V}$ , $V_{\text{GS}}=0\text{V}$	-	-	25	$\mu\text{A}$
	Drain-Source Leakage Current ( $T_j=125^\circ\text{C}$ )	$V_{\text{DS}}=18\text{V}$ , $V_{\text{GS}}=0\text{V}$	-	-	250	$\mu\text{A}$
$I_{\text{GSS}}$	Gate-Source Leakage	$V_{\text{GS}}= \pm 8\text{V}$	-	-	$\pm 100$	nA
$Q_g$	Total Gate Charge <sup>2</sup>	$I_{\text{D}}=18\text{A}$	-	17.5	-	nC
$Q_{\text{gs}}$	Gate-Source Charge		-	1.2	-	nC
$Q_{\text{gd}}$	Gate-Drain ("Miller") Charge		-	7.9	-	nC
$t_{\text{d}(\text{on})}$	Turn-on Delay Time <sup>2</sup>	$V_{\text{DS}}=10\text{V}$	-	7.3	-	ns
$t_r$	Rise Time	$I_{\text{D}}=18\text{A}$	-	98	-	ns
$t_{\text{d}(\text{off})}$	Turn-off Delay Time	$R_G=3.3\Omega$ , $V_{\text{GS}}=5\text{V}$	-	25.6	-	ns
$t_f$	Fall Time	$R_D=0.56\Omega$	-	98	-	ns
$C_{\text{iss}}$	Input Capacitance	$V_{\text{GS}}=0\text{V}$	-	527	-	pF
$C_{\text{oss}}$	Output Capacitance	$V_{\text{DS}}=18\text{V}$	-	258	-	pF
$C_{\text{rss}}$	Reverse Transfer Capacitance	f=1.0MHz	-	112	-	pF

### Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$I_s$	Continuous Source Current ( Body Diode )	$V_D=V_G=0\text{V}$ , $V_S=1.3\text{V}$	-	-	35	A
$I_{\text{SM}}$	Pulsed Source Current ( Body Diode ) <sup>1</sup>		-	-	90	A
$V_{\text{SD}}$	Forward On Voltage <sup>2</sup>	$T_j=25^\circ\text{C}$ , $I_s=35\text{A}$ , $V_{\text{GS}}=0\text{V}$	-	-	1.3	V

### Notes:

- 1.Pulse width limited by safe operating area.
- 2.Pulse width  $\leq 300\text{us}$  , duty cycle  $\leq 2\%$ .

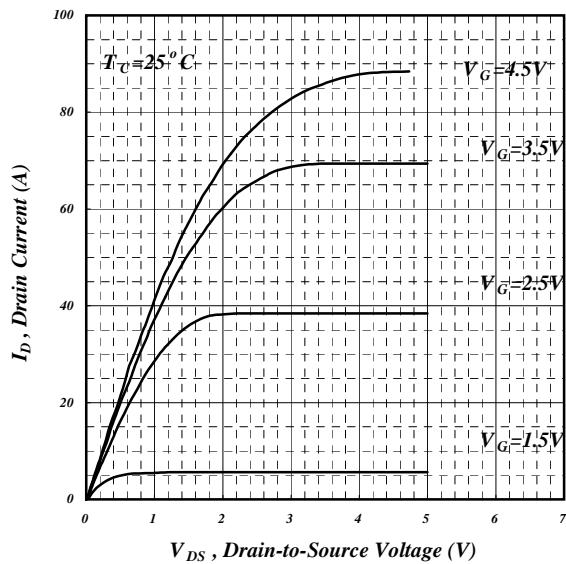


Fig 1. Typical Output Characteristics

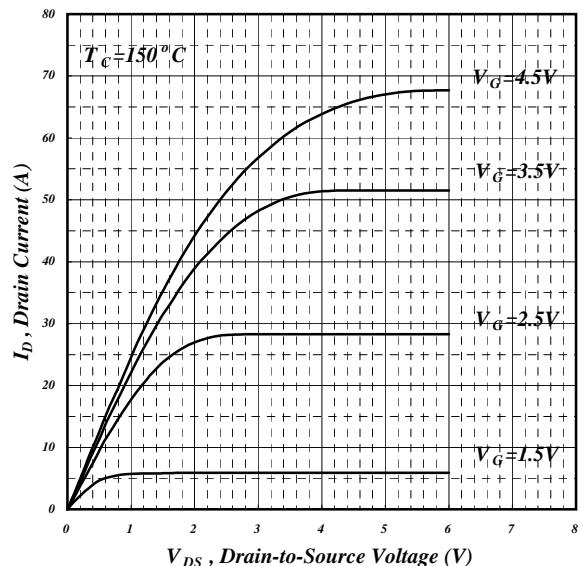
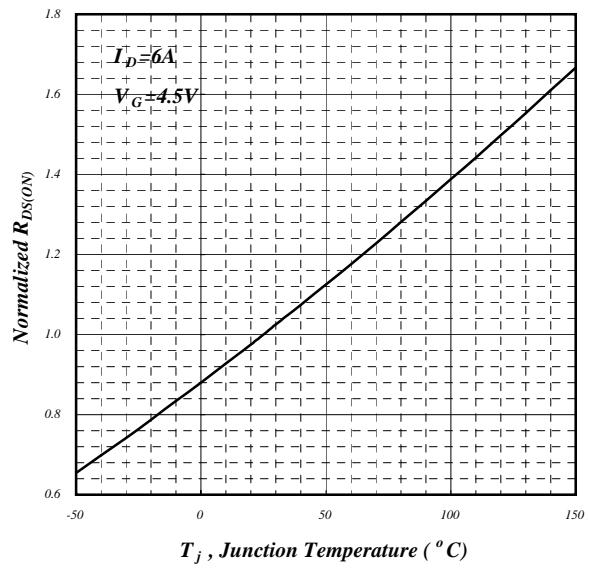
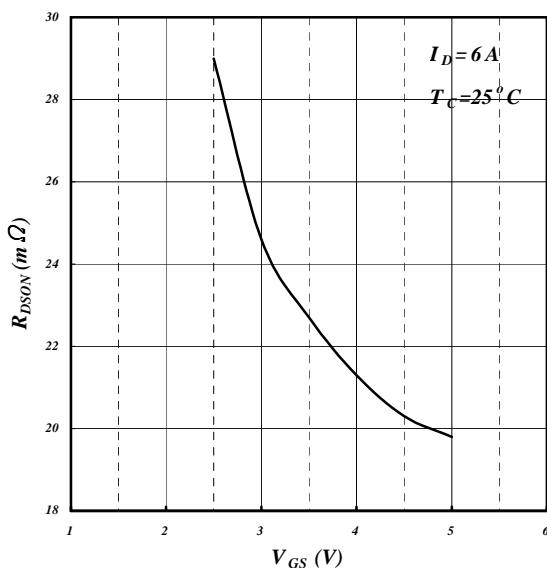


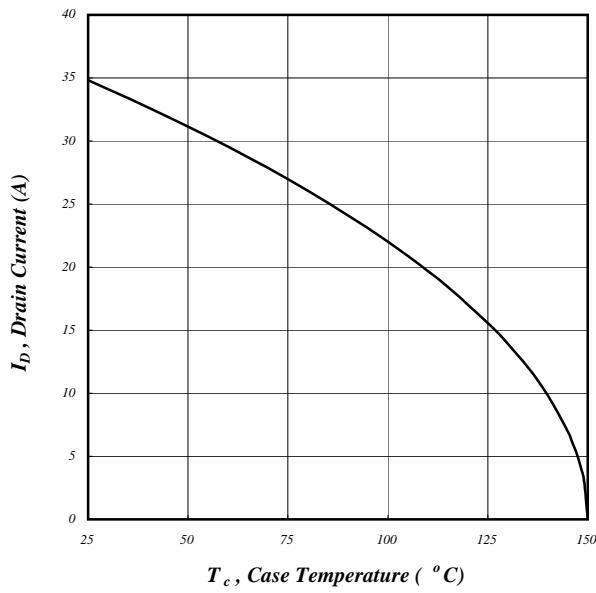
Fig 2. Typical Output Characteristics



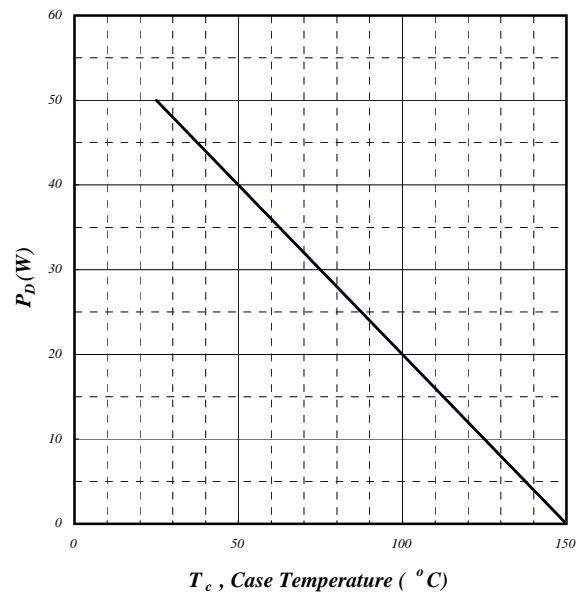
v.s. Junction Temperature



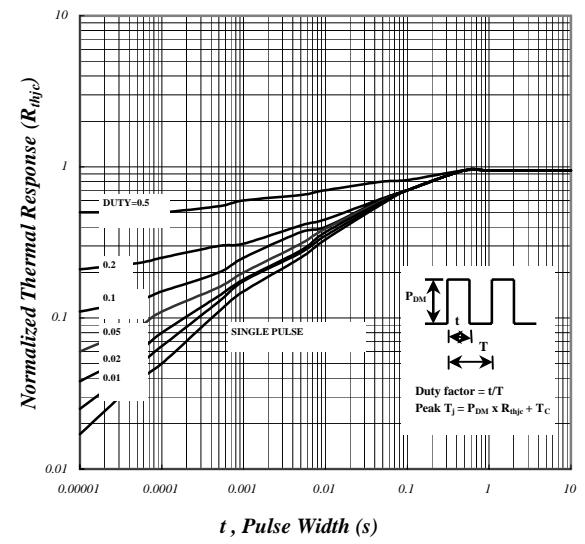
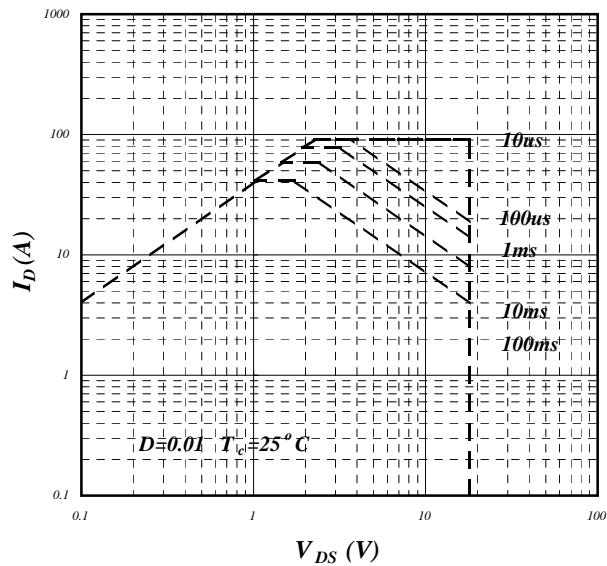
## AP9916GH/J



**Fig 5. Maximum Drain Current v.s.  
Case Temperature**



**Fig 6. Typical Power Dissipation**



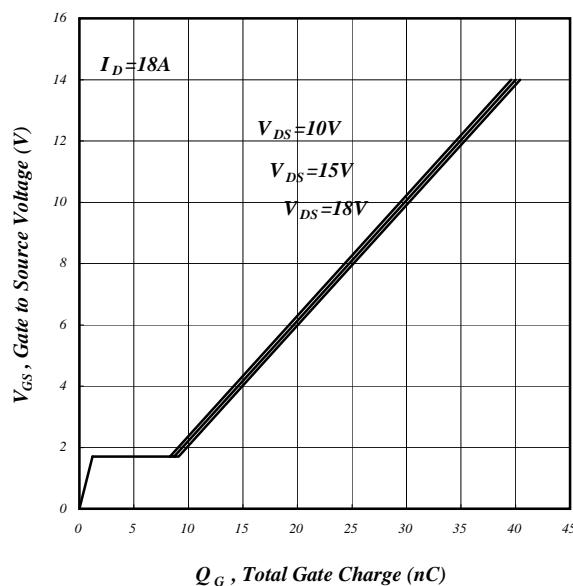


Fig 9. Gate Charge Characteristics

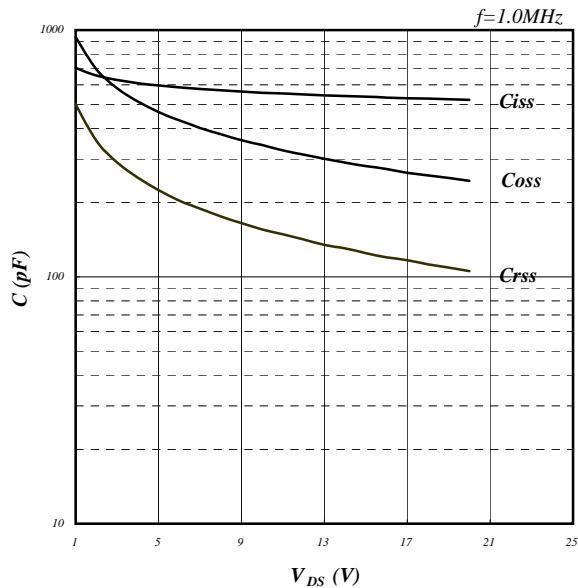
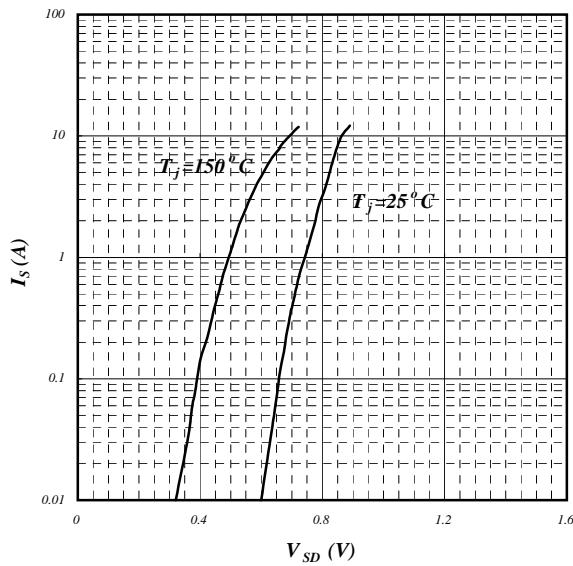
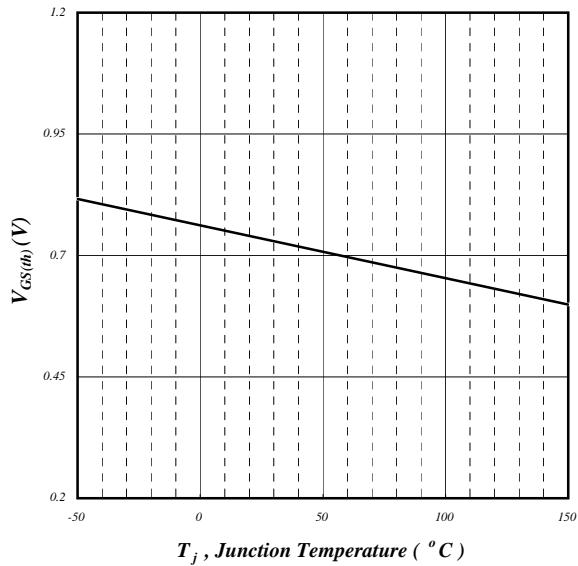


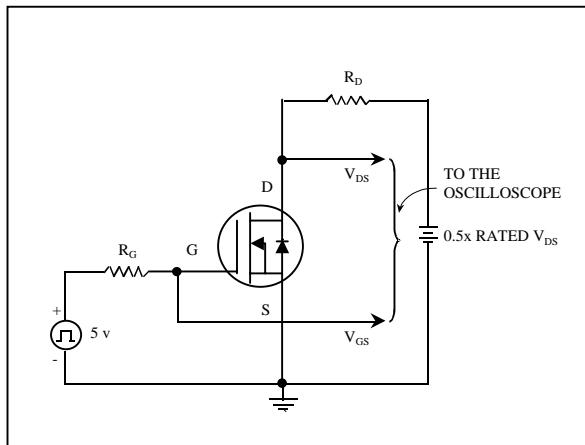
Fig 10. Typical Capacitance Characteristics



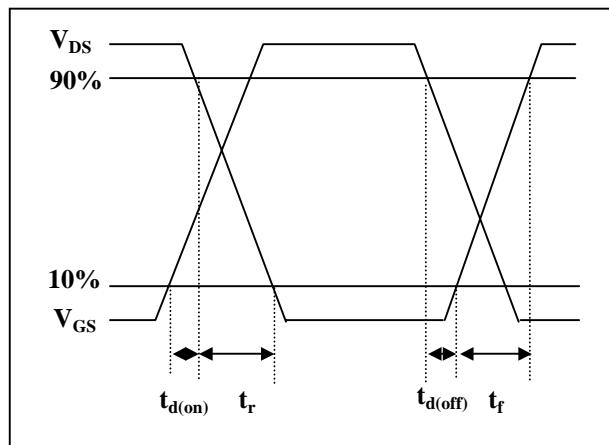
Reverse Diode



Junction Temperature



**Fig 13. Switching Time Circuit**



**Fig 14. Switching Time Waveform**

