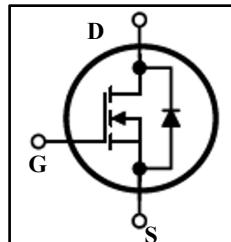
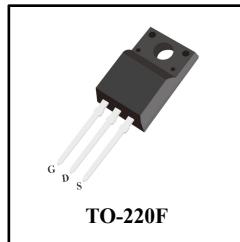


FEATURES

- BV_{DSS} : 650V, $I_D=7A$
- $R_{DS(on)}$: 1.4Ω(Max) @ $V_{GS}=10V$
- Very Low FOM ($R_{DS(on)} * Q_g$)
- Excellent stability and uniformity

APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC to DC Converters


Ordering Information

Type NO.	Marking	Package Code
MPVA7N65F	MPVA7N65F	TO-220F

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS} = 0V$)	V_{DSS}	650	V
Continuous Drain Current	I_D	7	A
Pulsed Drain Current (note1)	I_{DM}	28	A
Gate-Source Voltage	V_{GSS}	± 30	V
Single Pulse Avalanche Energy (note2)	E_{AS}	230	mJ
Avalanche Current (note1)	I_{AR}	4	A
Repetitive Avalanche Energy (note1)	E_{AR}	21.7	mJ
Power Dissipation ($T_C = 25^\circ C$)	P_D	35	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	°C

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	R_{thJC}	1.98	°C/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	



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MPVA7N65F

Power MOSFET

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_D = 250\mu\text{A}$	650	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{\text{DS}} = 650\text{V}, V_{\text{GS}} = 0\text{V}, T_J = 25^\circ\text{C}$	--	--	1	μA
Gate-Source Leakage	I_{GSS}	$V_{\text{GS}} = \pm 30\text{V}$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_D = 250\mu\text{A}$	2.0	--	4.0	V
Drain-Source On-Resistance (Note4)	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = 10\text{V}, I_D = 3.5\text{A}$	--	1.1	1.4	Ω
Dynamic						
Input Capacitance	C_{iss}	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 25\text{V}, f = 1.0\text{MHz}$	--	1178	--	pF
Output Capacitance	C_{oss}		--	89	--	
Reverse Transfer Capacitance	C_{rss}		--	10	--	
Total Gate Charge	Q_g	$V_{\text{DD}} = 400\text{V}, I_D = 7.0\text{A}, V_{\text{GS}} = 10\text{V}$	--	19	--	nC
Gate-Source Charge	Q_{gs}		--	5	--	
Gate-Drain Charge	Q_{gd}		--	5	--	
Turn-on Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = 325\text{V}, I_D = 7.0\text{A}, R_G = 25\Omega$	--	33	--	ns
Turn-on Rise Time	t_r		--	50	--	
Turn-off Delay Time	$t_{\text{d}(\text{off})}$		--	42	--	
Turn-off Fall Time	t_f		--	35	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	7	A
Pulsed Diode Forward Current	I_{SM}		--	--	28	
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{\text{SD}} = 7.0\text{A}, V_{\text{GS}} = 0\text{V}$	--	--	1.4	V
Reverse Recovery Time	t_{rr}	$V_R = 400\text{V}, I_F = 7.0\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	--	365	--	ns
Reverse Recovery Charge	Q_{rr}		--	3.4	--	μC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $L = 10\text{mH}, V_{\text{DD}} = 50\text{V}, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$
4. Essentially independent of operating temperature

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics

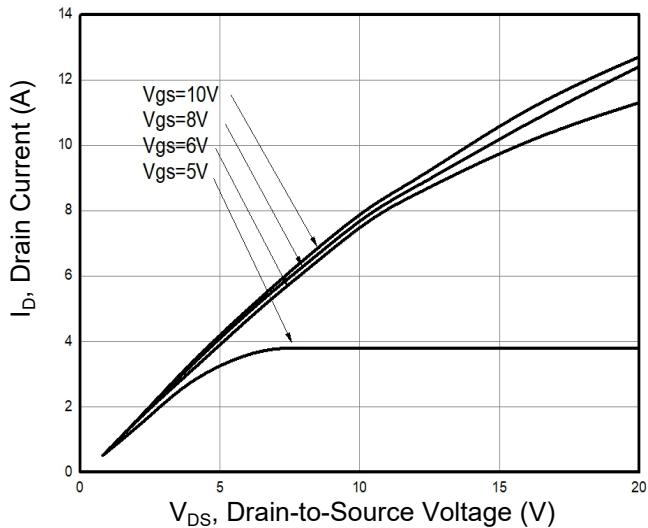


Figure 2. Transfer Characteristics

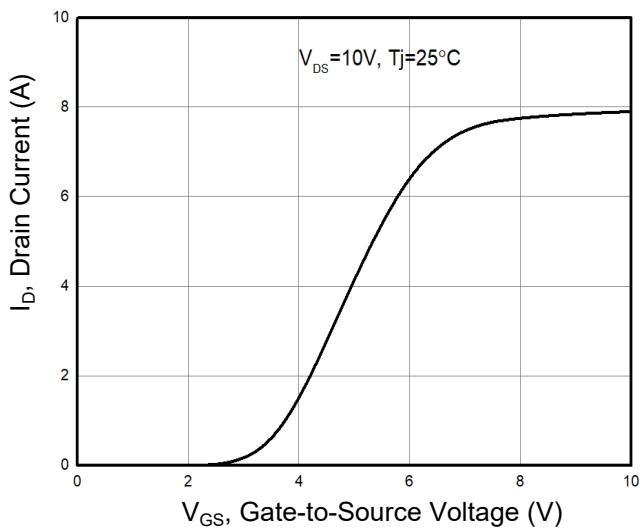


Figure 3. Drain Current vs. Temperature

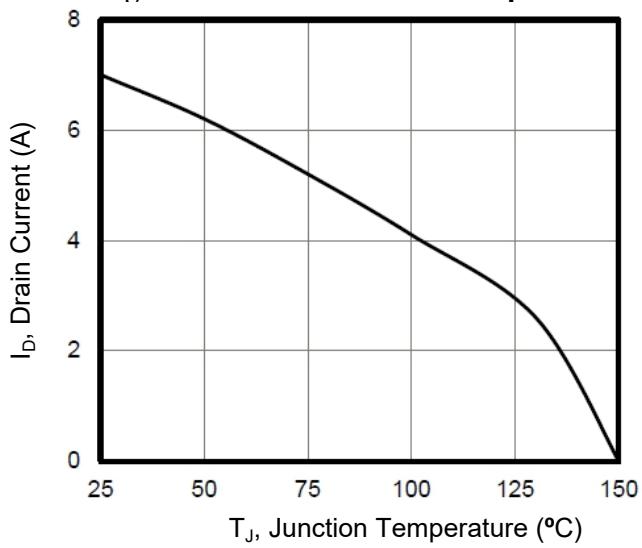


Figure 4. Capacitance

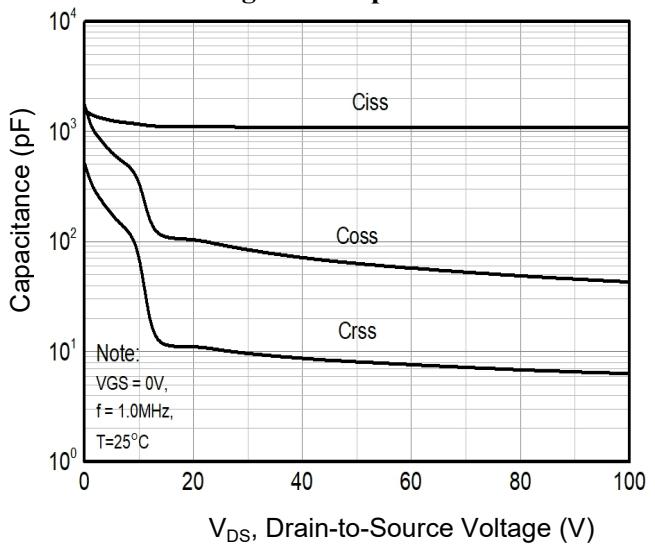


Figure 5. Gate Charge

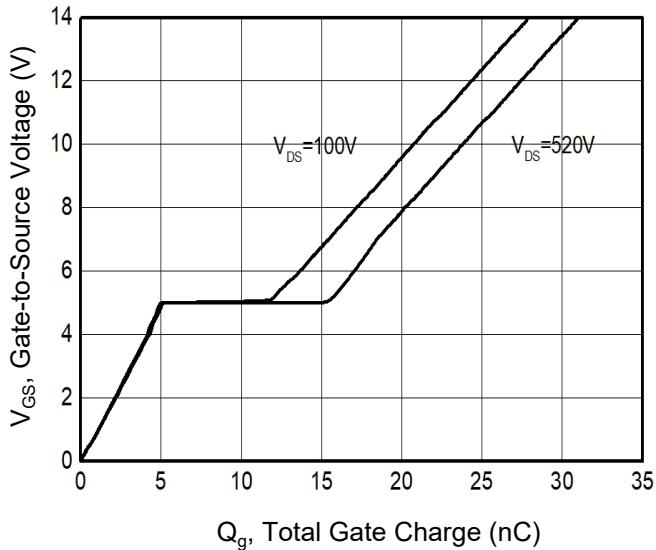
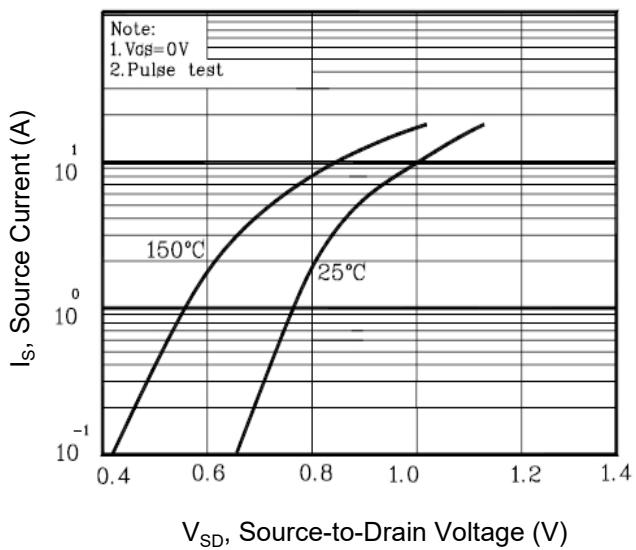


Figure 6. Body Diode Forward Voltage



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. On-Resistance vs. Temperature

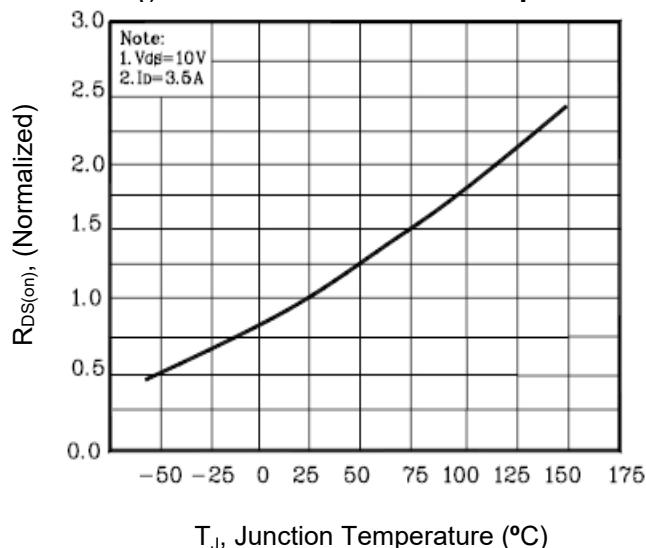


Figure 8. BV_{DSS} vs. Temperature

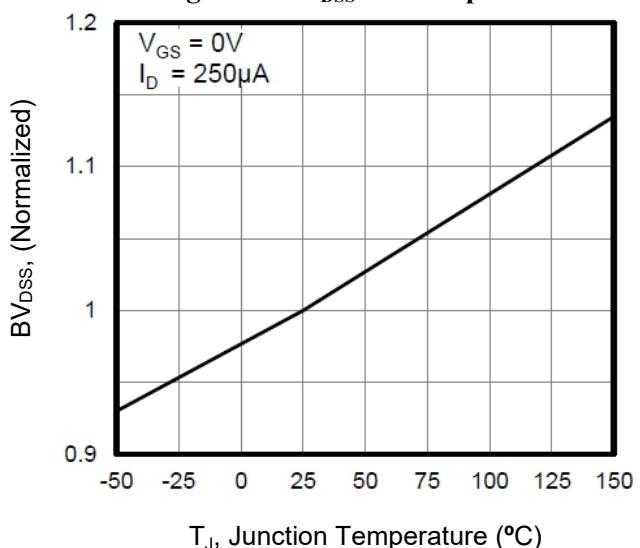


Figure 9. Transient Thermal Impedance

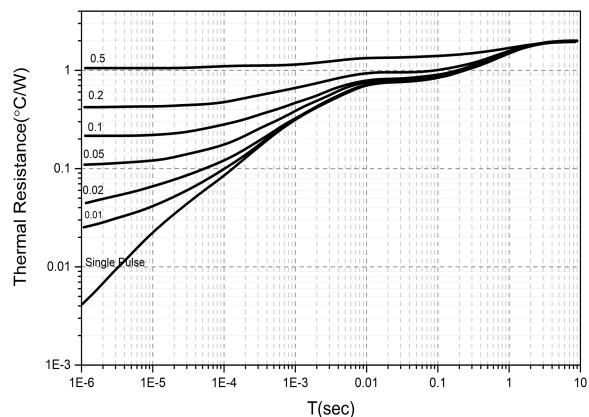
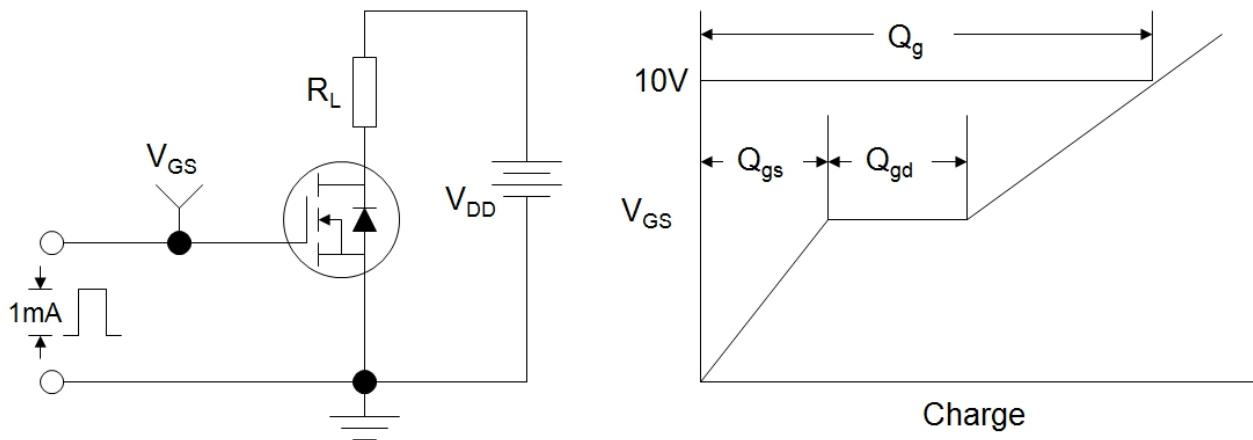
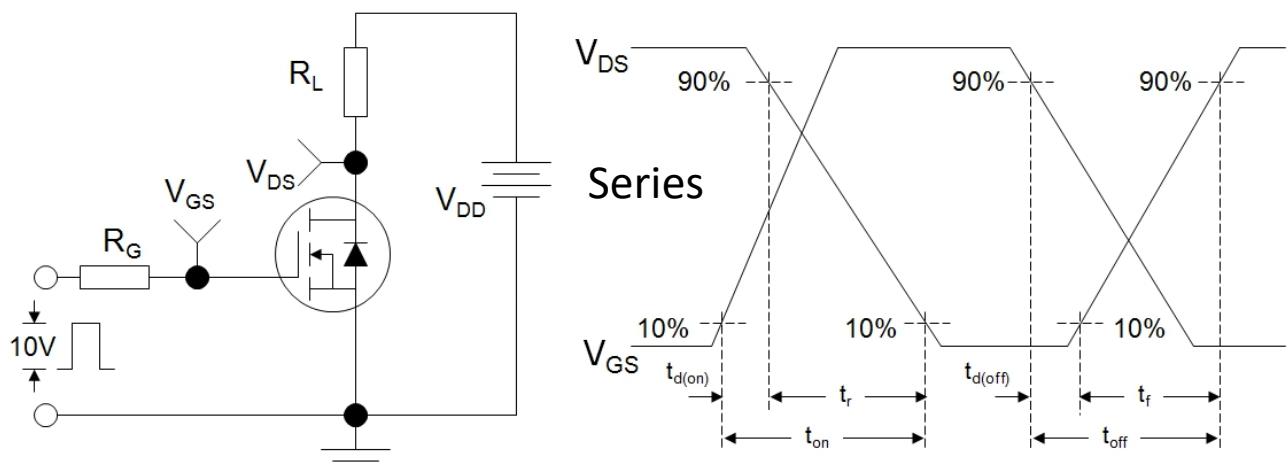
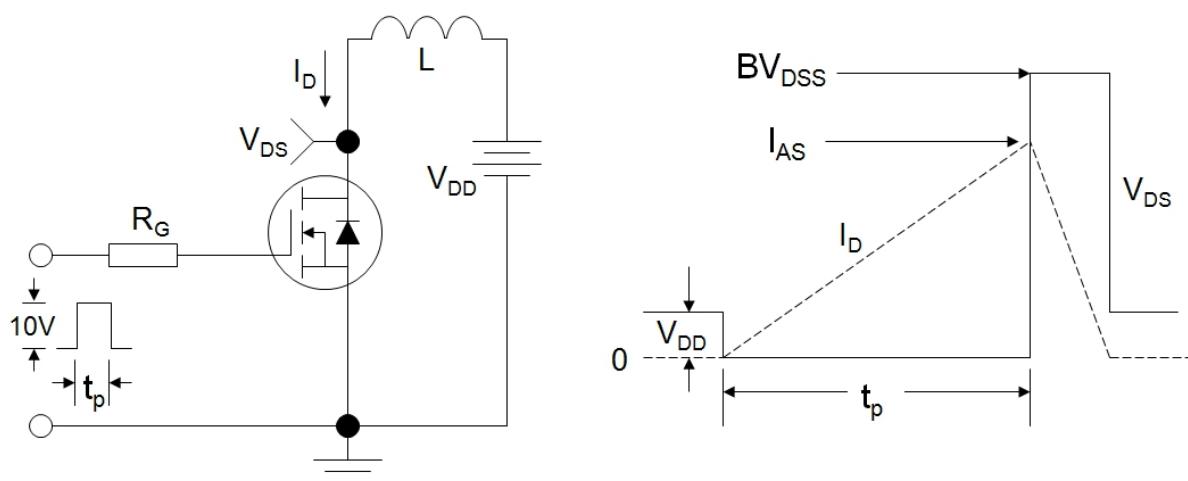


Figure A: Gate Charge Test Circuit and Waveform

Figure B: Resistive Switching Test Circuit and Waveform

Figure C: Unclamped Inductive Switching Test Circuit and Waveform


Outline Dimension

Unit: mm

TO-220F
