



General Description

AFC3346W, N & P Pair enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

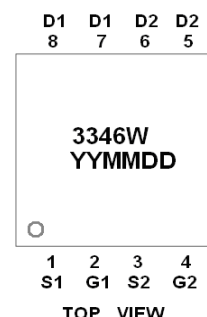
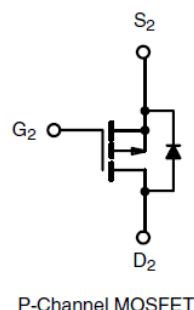
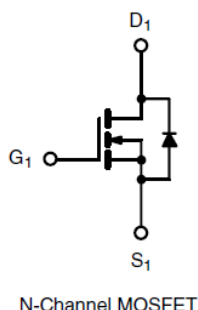
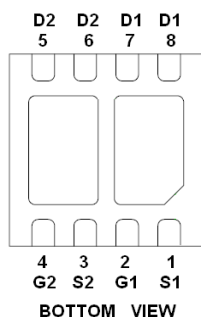
N-Channel

- 40V/15A, $R_{DS(ON)} = 28m\Omega @ V_{GS} = 10V$
- 40V/12A, $R_{DS(ON)} = 38m\Omega @ V_{GS} = 4.5V$

P-Channel

- -40V/-12A, $R_{DS(ON)} = 45m\Omega @ V_{GS} = -10V$
- -40V/-10A, $R_{DS(ON)} = 62m\Omega @ V_{GS} = -4.5V$

Pin Description (DFN3X3-8L)



Application

- DC/DC Conversion
- Load Switch
- DC FAN

Pin Define

Pin	Symbol	Description
1	S1	Source 1
2	G1	Gate 1
3	S2	Source 2
4	G2	Gate 2
5	D2	Drain 2
6	D2	Drain 2
7	D1	Drain 1
8	D1	Drain 1

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFC3346WFN338RG	3346W YYMMDD	DFN3X3-8L	Tape & Reel	5000 EA

- ※ YY year code
- ※ MM month code
- ※ DD date code
- ※ AFC3346WFN338RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings (N-Channel)

($T_A=25^\circ\text{C}$ Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V_{DSS}	40	V
Gate –Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current($T_J=150^\circ\text{C}$)	I_D	$T_A=25^\circ\text{C}$	15
		$T_A=70^\circ\text{C}$	12
Pulsed Drain Current	I_{DM}	40	A
Continuous Source Current(Diode Conduction)	I_S	10	A
Power Dissipation	P_D	$T_C=25^\circ\text{C}$	2
		$T_C=70^\circ\text{C}$	1.5
Operating Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55/150	$^\circ\text{C}$
Thermal Resistance Junction-to-Case (Drain)	$R_{\theta JC}$	5	$^\circ\text{C/W}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	40	

Electrical Characteristics (N-Channel)

($T_A=25^\circ\text{C}$ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		3.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=32V, V_{GS}=0V$			1	uA
		$V_{DS}=32V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=10V$	20			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15A$		20	28	m Ω
		$V_{GS}=4.5V, I_D=12A$		30	38	
Forward Transconductance	g_{FS}	$V_{DS}=15V, I_D=5.0A$		25		S
Diode Forward Voltage	V_{SD}	$I_S=2A, V_{GS}=0V$		0.85	1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=20V, V_{GS}=4.5V$ $I_D=5A$		10	14	nC
Gate-Source Charge	Q_{gs}			2.8		
Gate-Drain Charge	Q_{gd}			3.2		
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V$ $f=1\text{MHz}$		850		pF
Output Capacitance	C_{oss}			110		
Reverse Transfer Capacitance	C_{rss}			75		
Turn-On Time	$t_{d(on)}$	$V_{DD}=20V, R_L=4\Omega$ $I_D=5.0A, V_{GEN}=10V$ $R_G=1\Omega$		6	12	ns
	t_r			10	20	
Turn-Off Time	$t_{d(off)}$			20	36	
	t_f			6	12	



Absolute Maximum Ratings (P-Channel)

($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V_{DSS}	-40	V
Gate –Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current($T_J=150^{\circ}\text{C}$)	I_D	$T_A=25^{\circ}\text{C}$	-12.0
		$T_A=70^{\circ}\text{C}$	-10.0
Pulsed Drain Current	I_{DM}	-40	A
Continuous Source Current(Diode Conduction)	I_S	-10	A
Power Dissipation	P_D	$T_C=25^{\circ}\text{C}$	1.8
		$T_C=70^{\circ}\text{C}$	1.2
Operating Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55/150	$^{\circ}\text{C}$
Thermal Resistance Junction-to-Case (Drain)	$R_{\theta JC}$	5	$^{\circ}\text{C}/\text{W}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	40	

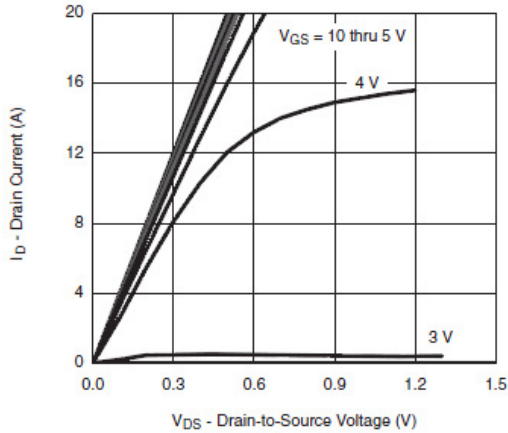
Electrical Characteristics (P-Channel)

($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

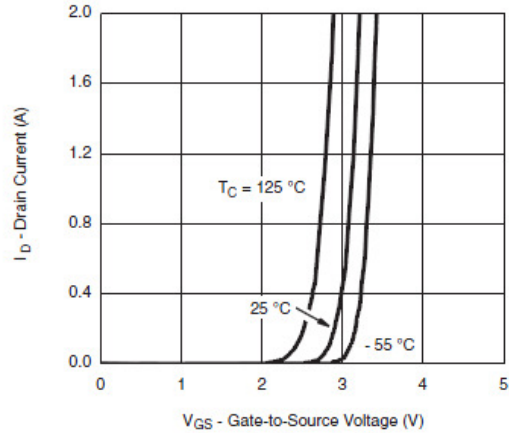
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D = -250\mu A$	-40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D = -250\mu A$	-1.0		-3.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS} = \pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -32V, V_{GS}=0V$			-1	uA
		$V_{DS} = -32V, V_{GS}=0V$ $T_J=85^{\circ}\text{C}$			-20	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq -5V, V_{GS} = -10V$	-20			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -12A$		34	45	m Ω
		$V_{GS} = -4.5V, I_D = -10A$		48	62	
Forward Transconductance	g_{FS}	$V_{DS} = -15V, I_D = -5A$		20		S
Diode Forward Voltage	V_{SD}	$I_S = -2A, V_{GS}=0V$		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS} = -20V, V_{GS} = -4.5V$ $I_D = -5.0A$		13	20	nC
Gate-Source Charge	Q_{gs}			4.5		
Gate-Drain Charge	Q_{gd}			6.5		
Input Capacitance	C_{iss}	$V_{DS} = -20V, V_{GS} = 0V$ $f = 1\text{MHz}$		1100		pF
Output Capacitance	C_{oss}			145		
Reverse Transfer Capacitance	C_{rss}			115		
Turn-On Time	$t_{d(on)}$	$V_{DD} = -20V, R_L = 4\Omega$ $I_D = -5.0A, V_{GEN} = -4.5V$ $R_G = 1\Omega$		40	80	ns
	t_r			55	100	
Turn-Off Time	$t_{d(off)}$			30	60	
	t_f			12	20	



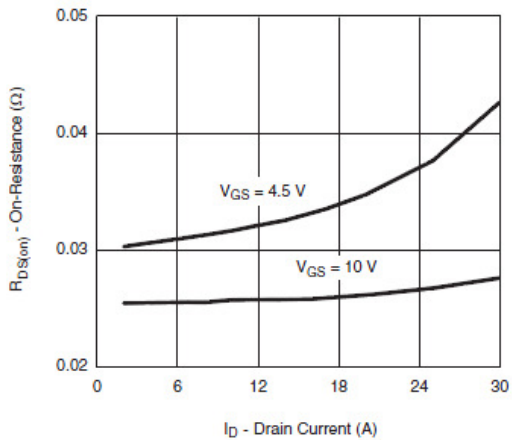
Typical Characteristics (N-Channel)



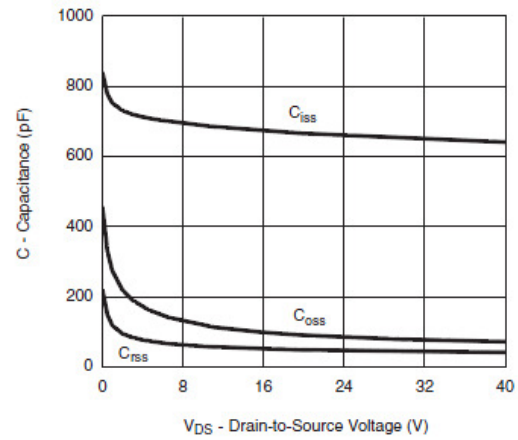
Output Characteristics



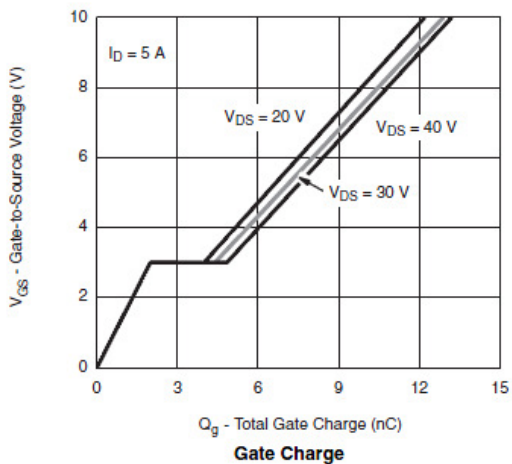
Transfer Characteristics



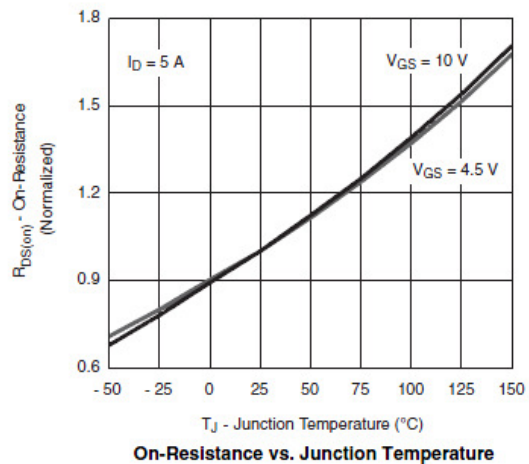
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



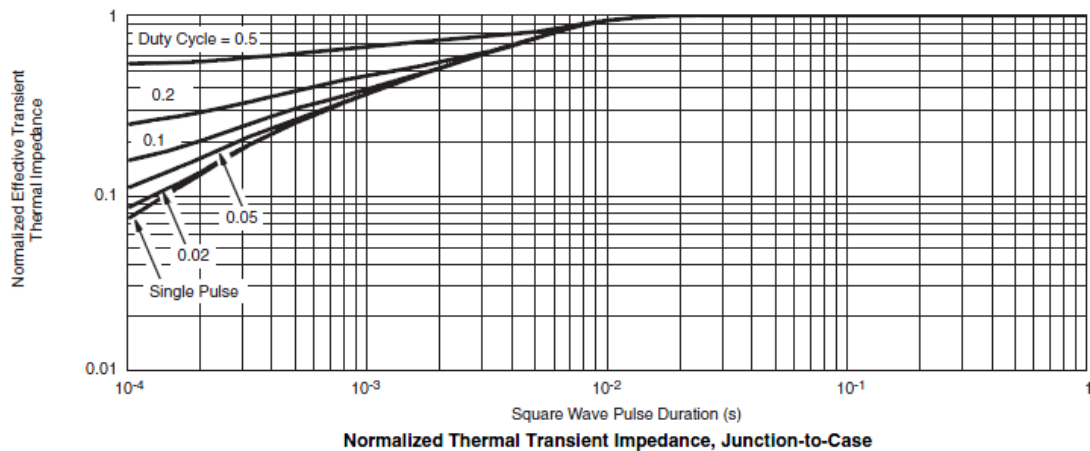
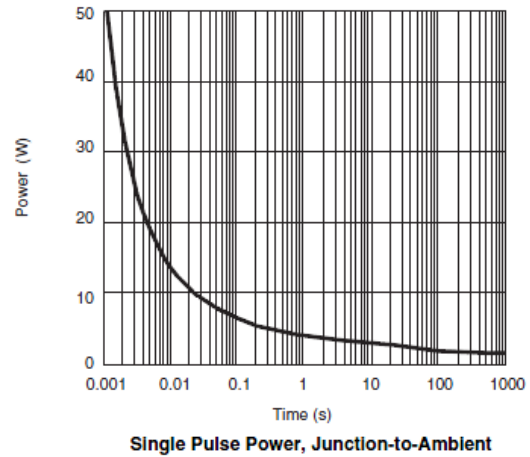
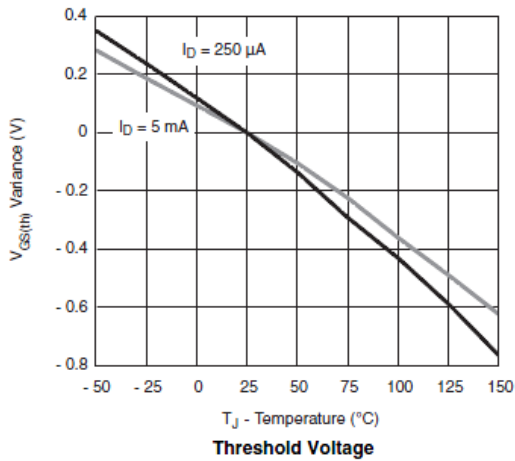
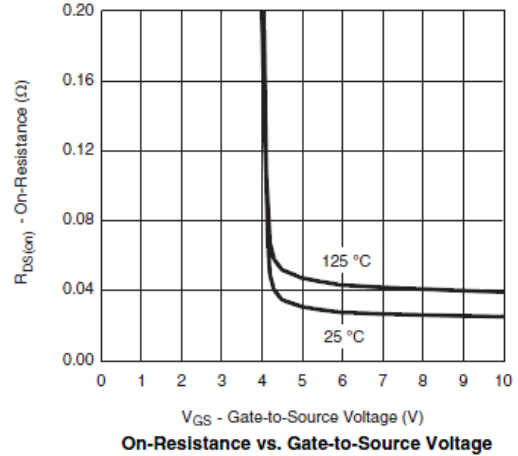
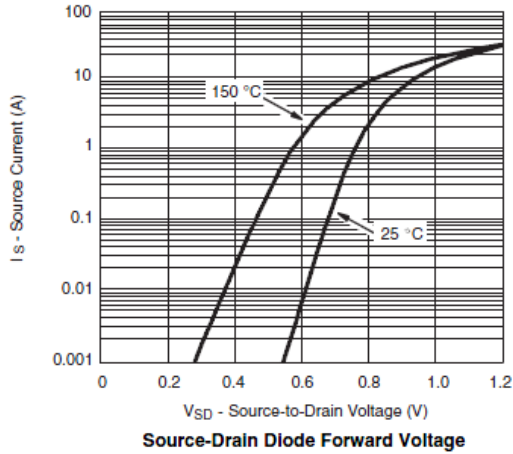
Gate Charge



On-Resistance vs. Junction Temperature

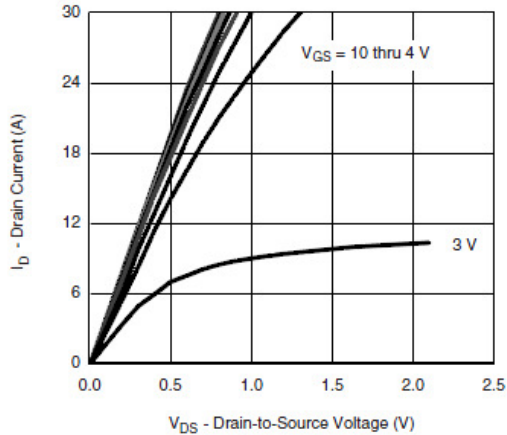


Typical Characteristics (N-Channel)

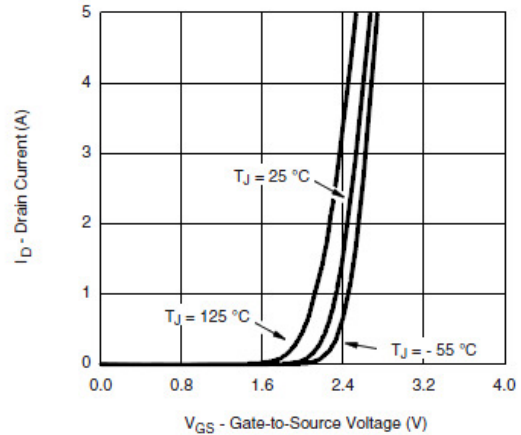




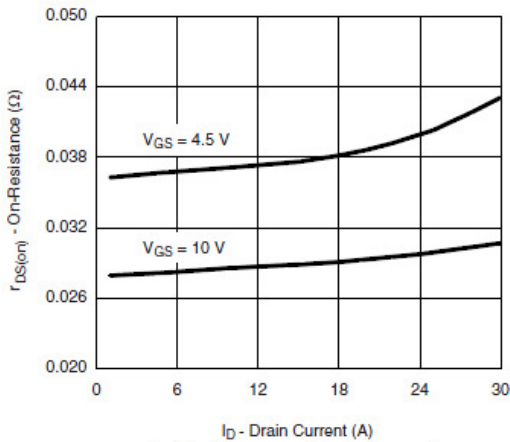
Typical Characteristics (P-Channel)



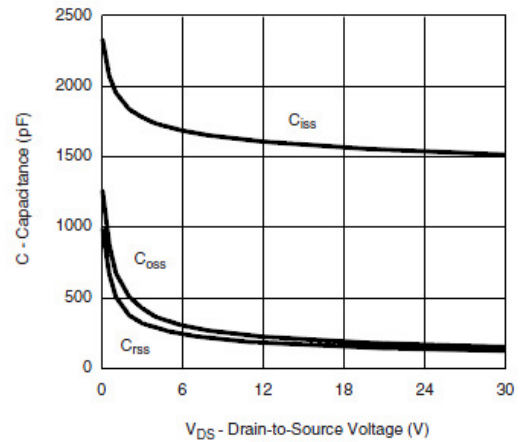
Output Characteristics



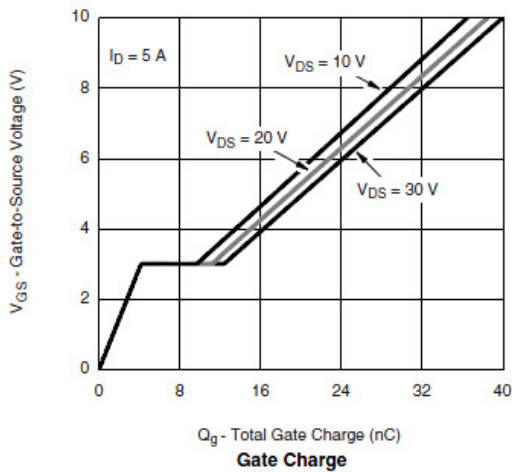
Transfer Characteristics



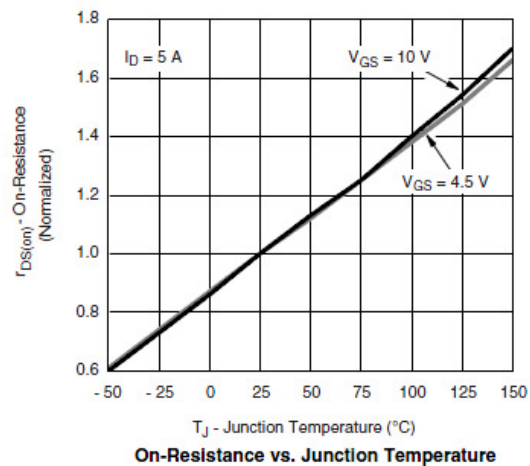
On-Resistance vs. Drain Current



Capacitance



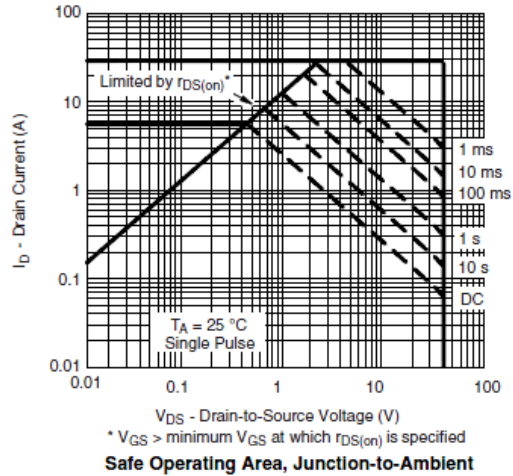
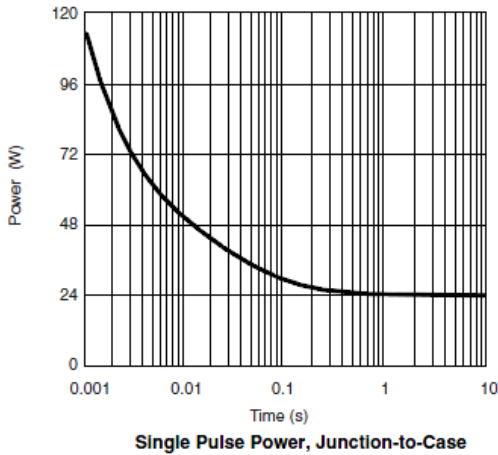
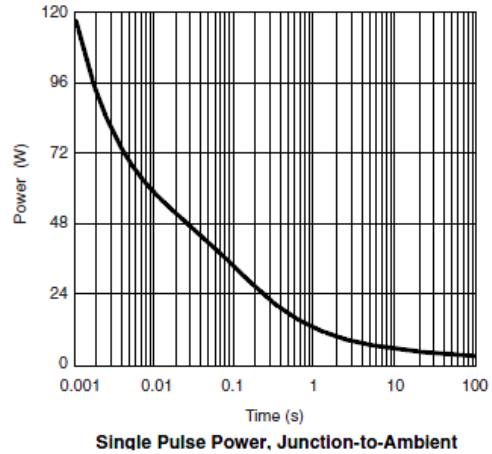
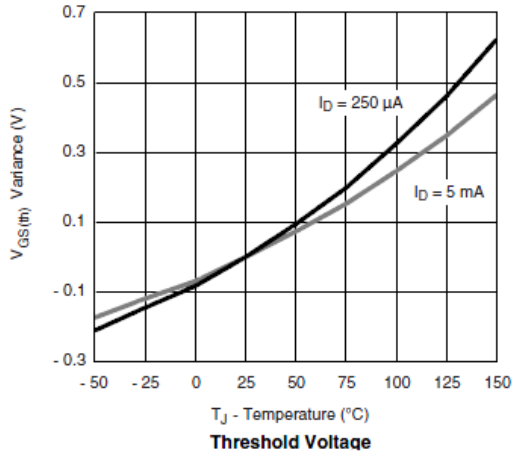
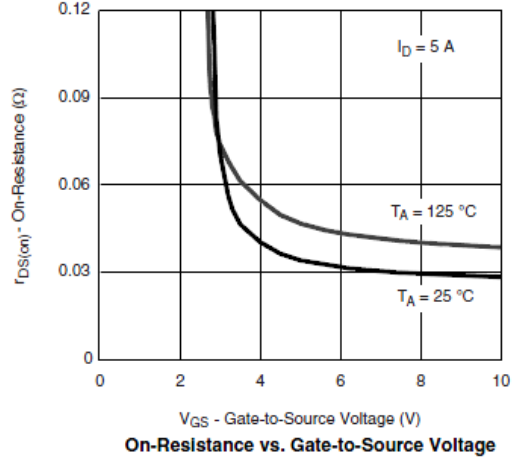
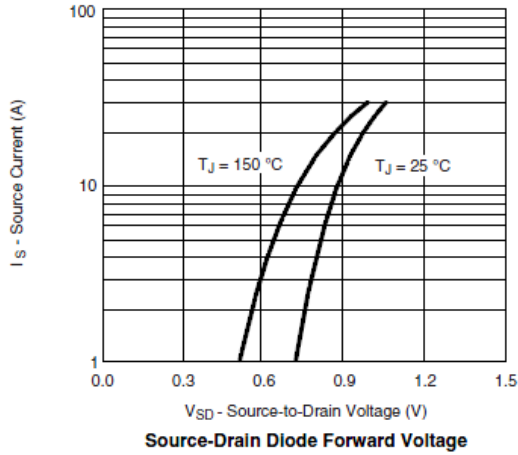
Gate Charge



On-Resistance vs. Junction Temperature



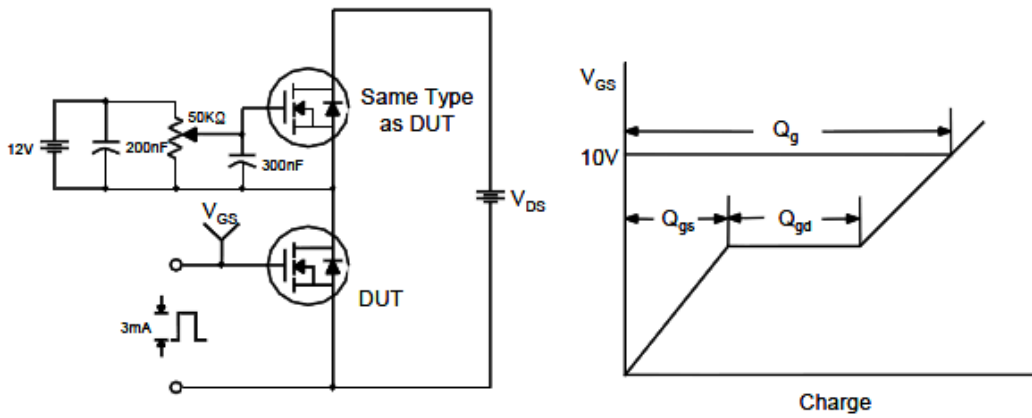
Typical Characteristics (P-Channel)



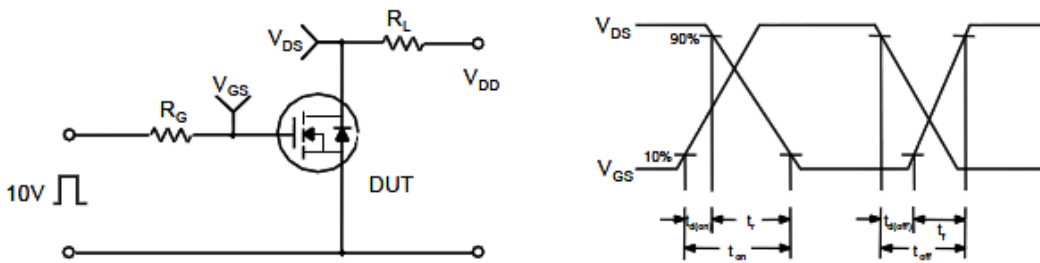


Typical Characteristics

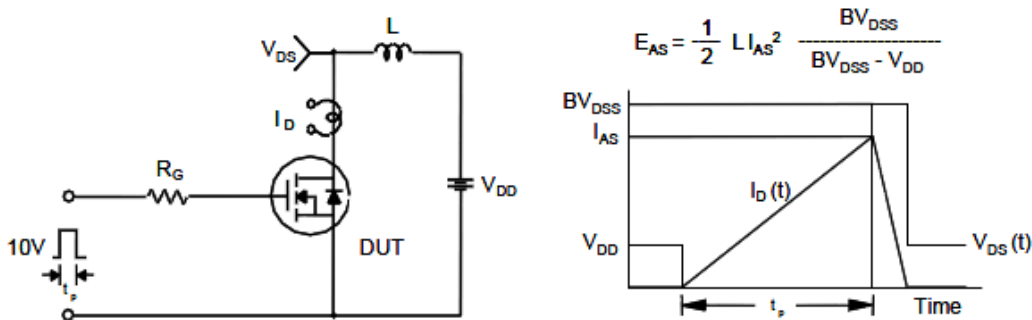
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

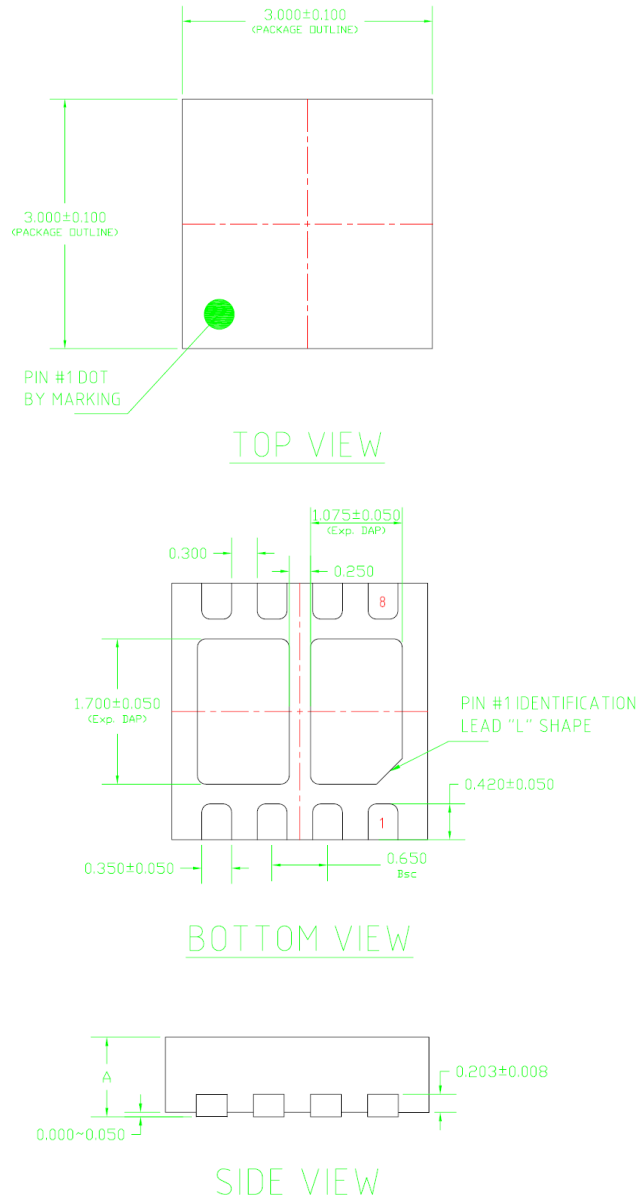


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (DFN3X3-8L)



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