Alfa-MOS Technology

AFP7117WS
150V P-Channel Enhancement Mode MOSFET

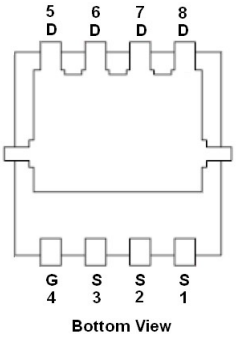
General Description

AFP7117WS, P-Channel 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, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

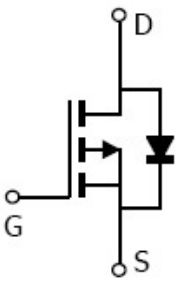
Features

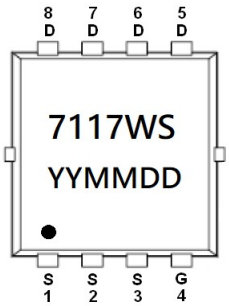
- I_D=-1.4A,$R_{DS(ON)}$=750 mΩ@V_{GS}=-10V
- I_D=-1.0A,$R_{DS(ON)}$=800 mΩ@V_{GS}=-6V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN3.3X3.3-8L package design

Pin Description (DFN3.3X3.3-8L)



Bottom View





Top View

Application

- DC-DC Converter
- POL

Pin Define

Pin	Symbol	Description
1	S	Source
2	S	Source
3	S	Source
4	G	Gate
5	D	Drain
6	D	Drain
7	D	Drain
8	D	Drain

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFP7117WSFN308RG	7117WS	DFN3.3X3.3-8L	Tape & Reel	5000 EA

※ YY year code
※ MM month code
※ DD date code
※ AFP7117WSFN308RG : 13”Tape & Reel ; Pb- Free ; Halogen –Free

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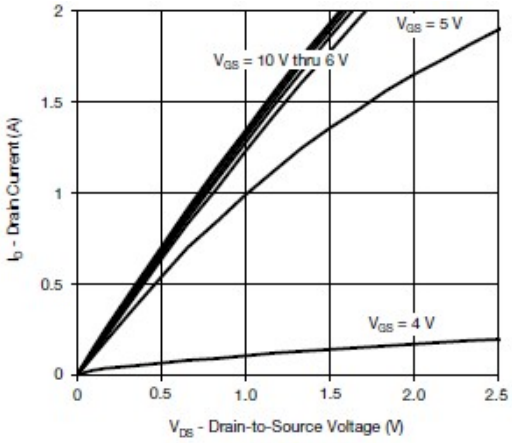
Absolute Maximum Ratings (T_A=25℃ Unless otherwise noted)

Parameter			Symbol	Value		Unit
Drain-Source Voltage			V_{DSS}	-150		V
Gate –Source Voltage			V_{GSS}	±20		V
Continuous Drain Current(T_J=150℃)	T_C=25℃	T_C=70℃	I_D	-2.8	-2.0	A
	T_A=25℃	T_A=70℃		-1.4	-1.0	
Pulsed Drain Current			I_{DM}	-4.5		A
Single pulse avalanche energy	L=1.0 mH		I_{AS}	4		A
			E_{AS}	0.8		mJ
Continuous Source Current (Diode Conduction)	T_C=25℃	T_A=25℃	I_S	-10	-2.7	A
Power Dissipation	T_C=25℃	T_C=70℃	P_D	20	13	W
	T_A=25℃	T_A=70℃		1.6	1.0	
Operating Junction Temperature			T_J	150		℃
Storage Temperature Range			T_{STG}	-55/150		℃
Thermal Resistance Junction-to-Case (Drain)			$R_{\theta JC}$	5		℃/W
Thermal Resistance-Junction to Ambient			$R_{\theta JA}$	35		

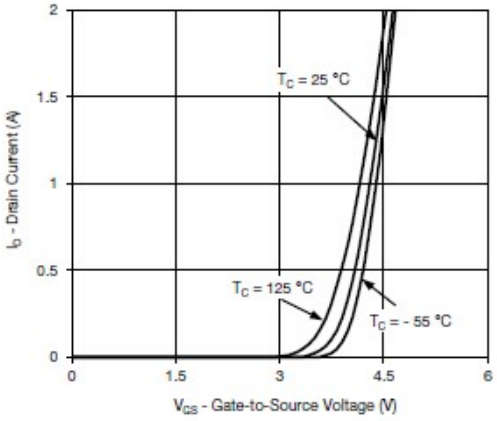
Electrical Characteristics (T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-250uA	-150	-165		V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250uA	-2.0	-3.0	-4.0	V
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-120V,V_{GS}=0V			-1	uA
		V_{DS}=-120V,V_{GS}=0V T_J=85℃			-30	
On-State Drain Current	$I_{D(on)}$	V_{DS}≦-15V,V_{GS}=-10V	-1.6			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=-10V,I_D=-1.4A		665	750	mΩ
		V_{GS}=-6V,I_D=-1.0A		715	800	
Forward Transconductance	g_{FS}	V_{DS}=-15V,I_D=-0.5A		2.8		S
Diode Forward Voltage	V_{SD}	I_S=-1.0A,V_{GS}=0V		-0.75	-1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=-75V,V_{GS}=-10V I_D≡-1.1A		9.2	12	nC
Gate-Source Charge	Q_{gs}			2.2		
Gate-Drain Charge	Q_{gd}			2.6		
Gate Resistance	R_g	f=1MHz		10	15	Ω
Pulse Diode Forward Current	I_{SM}				-12	A
Input Capacitance	C_{iss}	V_{DS}=-75V,V_{GS}=0V f=1MHz		380	500	pF
Output Capacitance	C_{oss}			24	45	
Reverse Transfer Capacitance	C_{rss}			12	25	
Turn-On Time	$t_{d(on)}$	V_{DD}=-75V,R_L=7.5Ω I_D≡-1.0A,V_{GEN}=-10V R_G=6.0Ω		10	20	ns
	t_r			15	30	
Turn-Off Time	$t_{d(off)}$			15	30	
	t_f			12	25	
Body Diode Reverse Recovery Time	t_{rr}	I_F=- 0.5 A, dI/dt=100 A/μs, T_J = 25 °C		50	100	ns
Body Diode Reverse Recovery Charge	Q_{rr}			95	150	nC

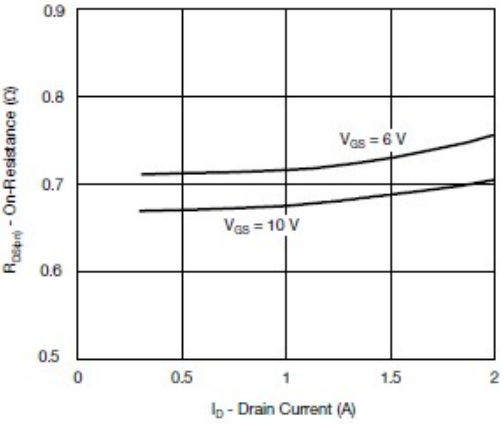
Typical Characteristics



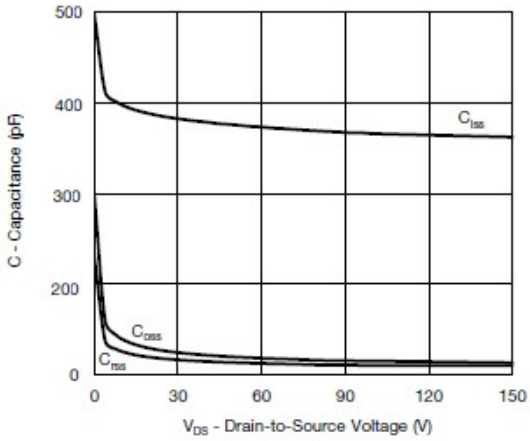
Output Characteristics



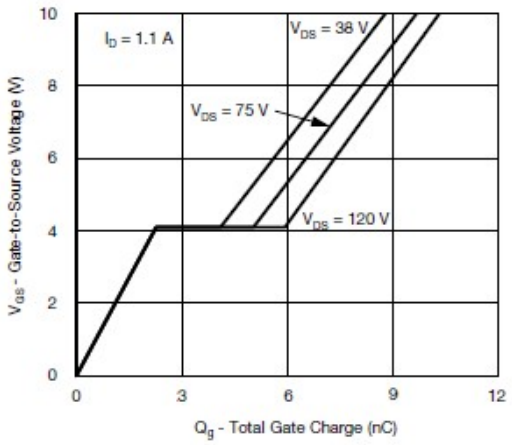
Transfer Characteristics



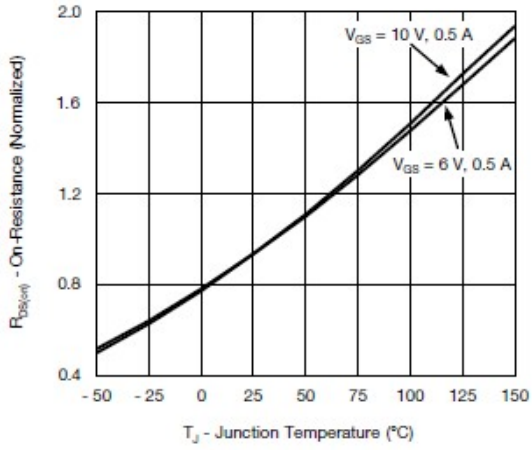
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

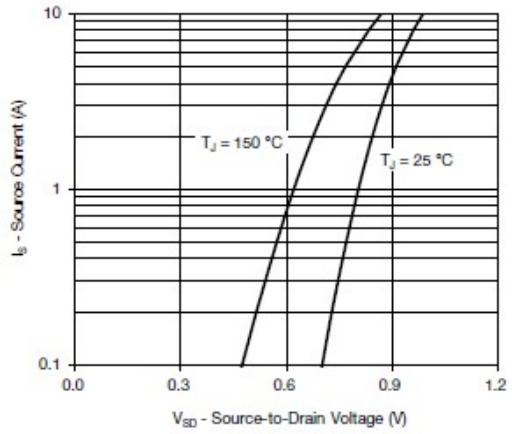


Gate Charge

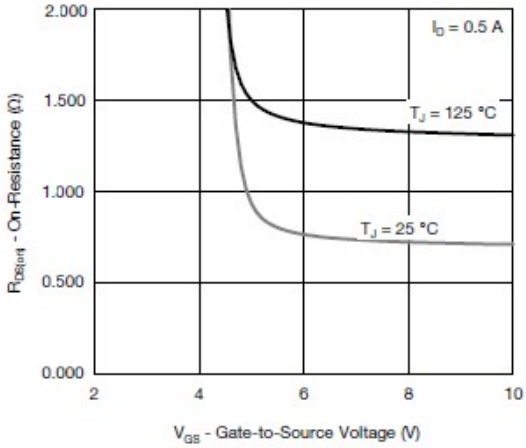


On-Resistance vs. Junction Temperature

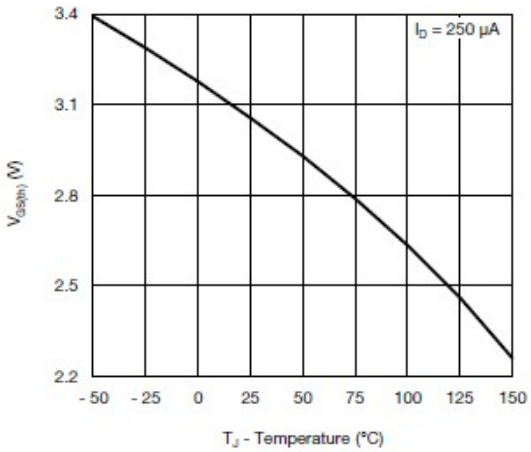
Typical Characteristics



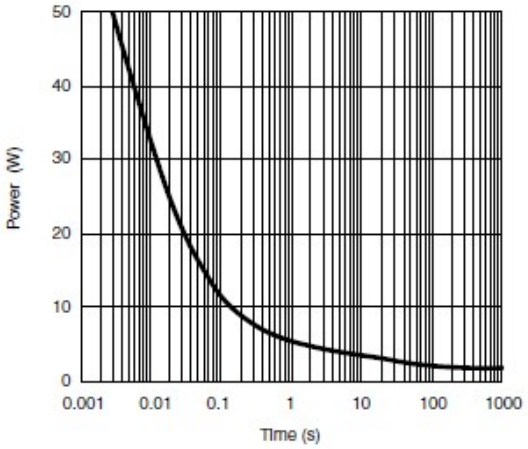
Source-Drain Diode Forward Voltage



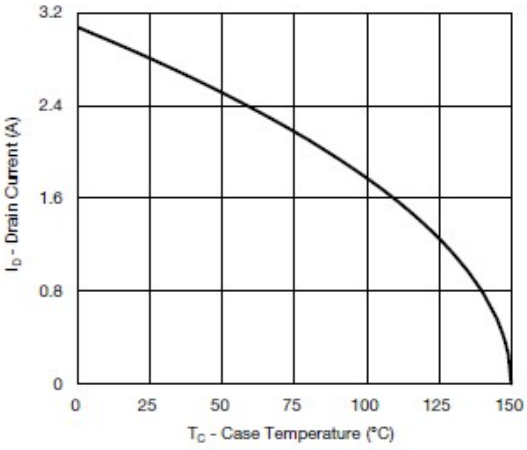
On-Resistance vs. Gate-to-Source Voltage



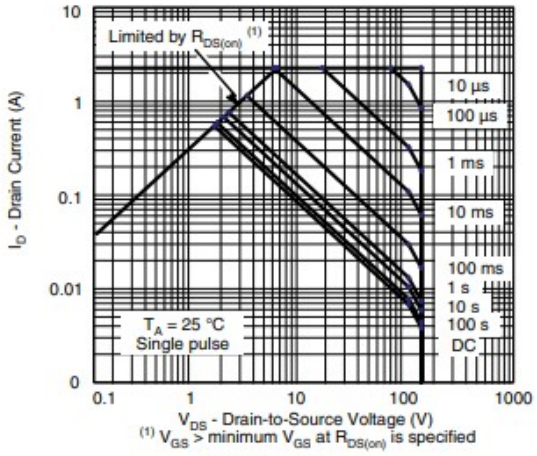
Threshold Voltage



Single Pulse Power, Junction-to-Ambient

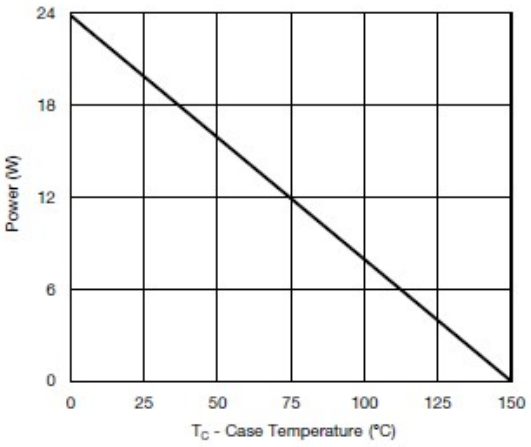


Max Current vs. Case Temperature

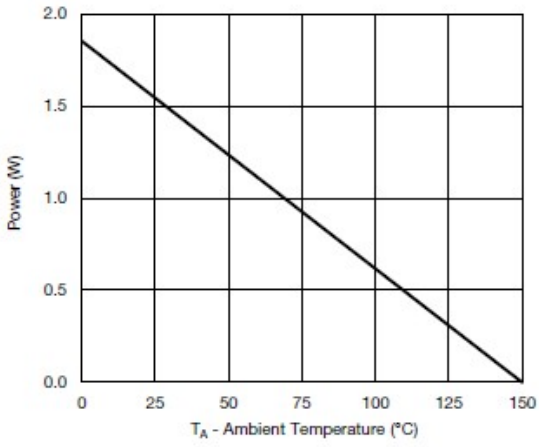


Safe Operating Area

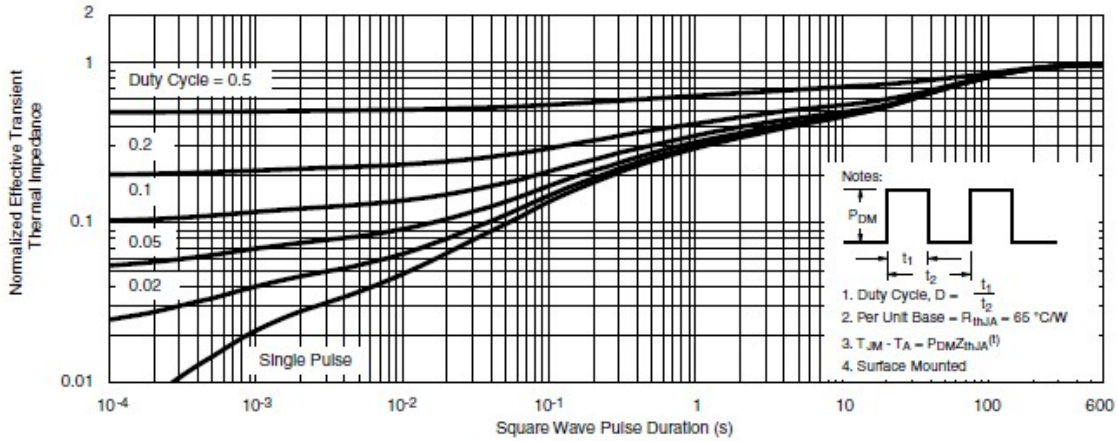
Typical Characteristics



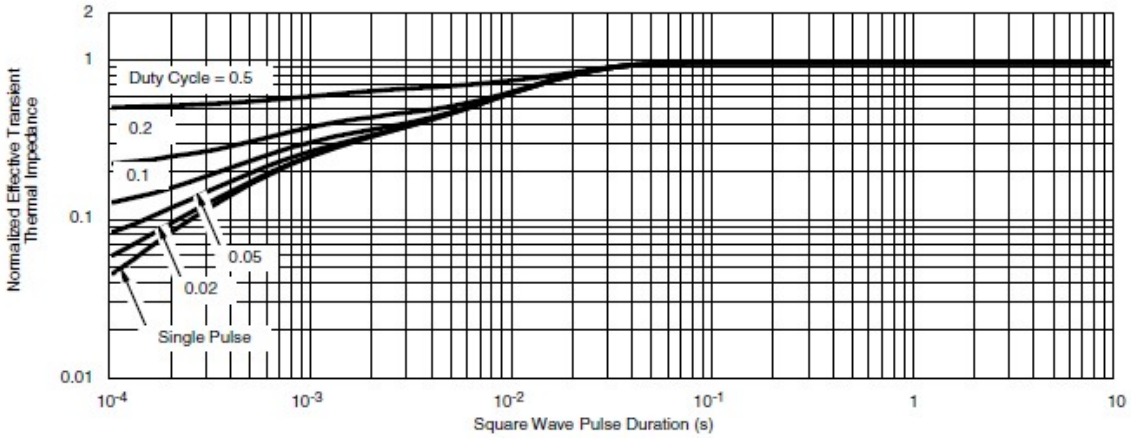
Power Junction-to-Case



Power Junction-to-Ambient



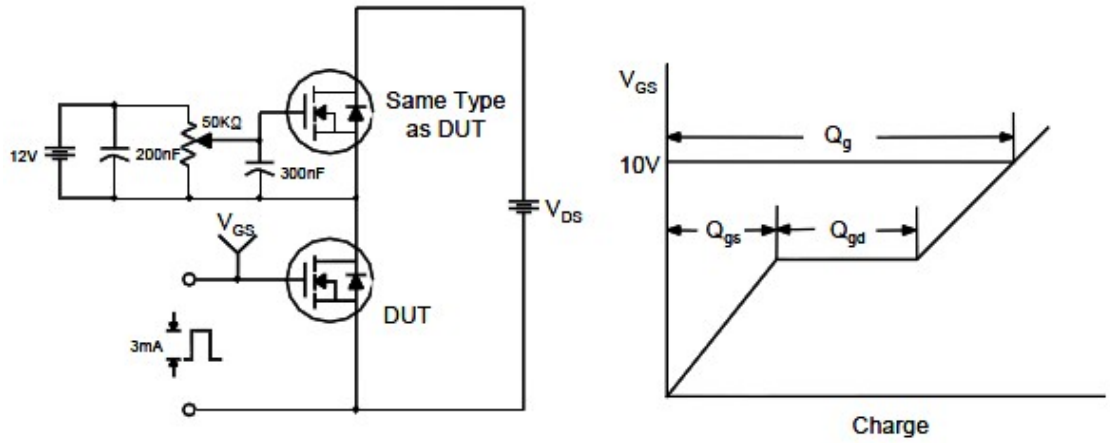
Normalized Thermal Transient Impedance, Junction-to-Ambient



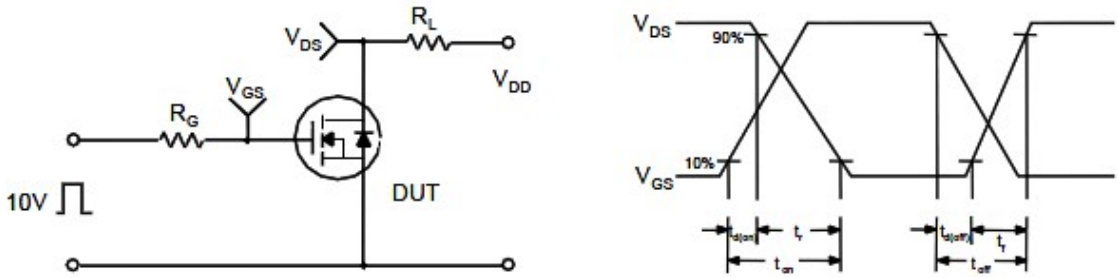
Normalized Thermal Transient Impedance, Junction-to-Case

Typical Characteristics

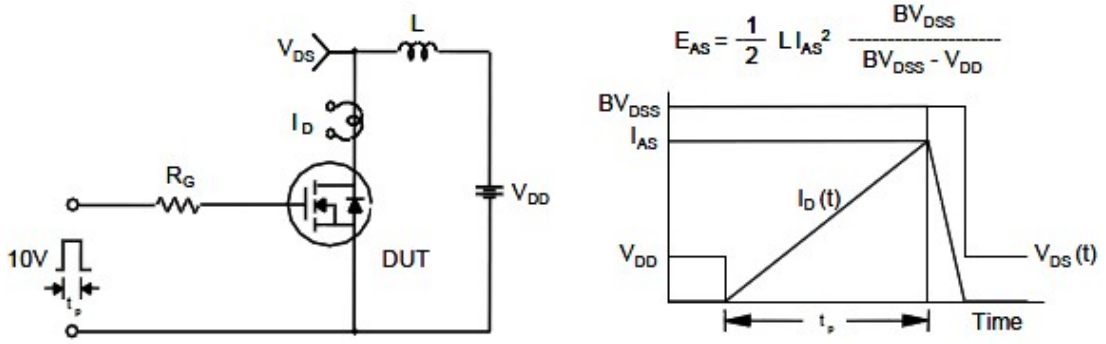
Gate Charge Test Circuit & Waveform



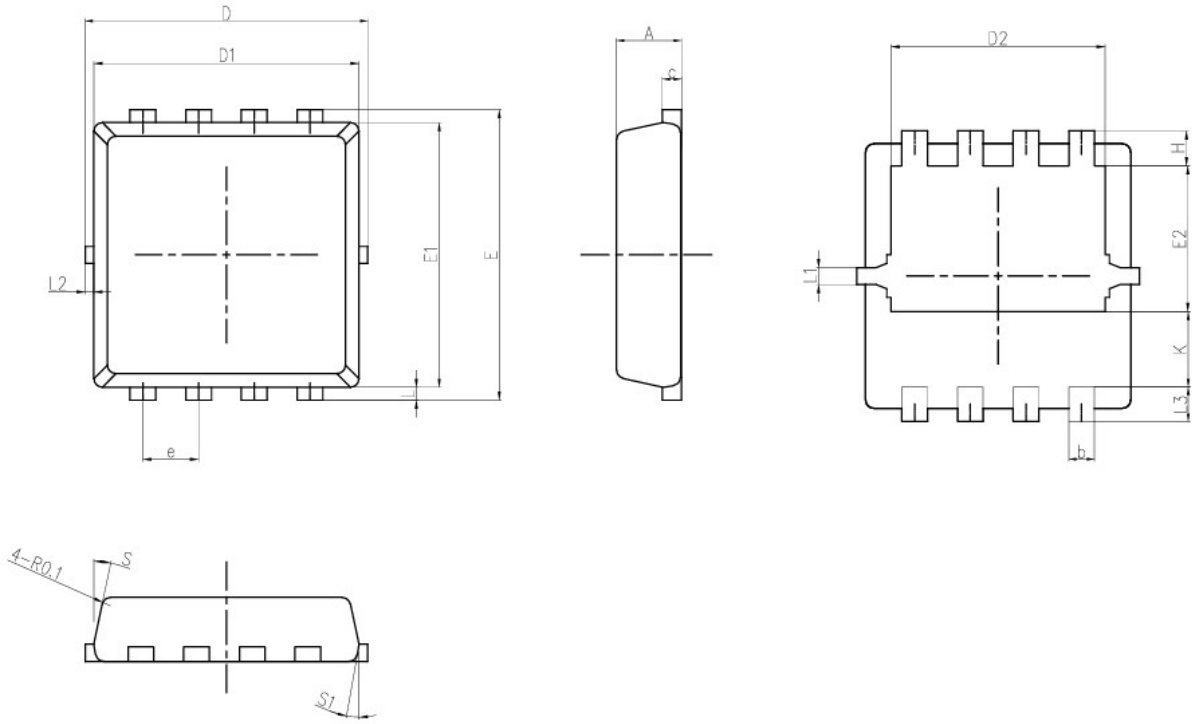
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Package Information (DFN3.3X3.3-8L)



COMMON DIMENSIONS (UNIT of MEASURE=MILLIMETER)											
SYMBOL	MIN	NOM	MAX	SYMBOL	MIN	NOM	MAX	SYMBOL	MIN	NOM	MAX
A	0.66	0.76	0.86	e	0.55	0.65	0.75	L	0.06	0.15	0.20
b	0.25	0.30	0.35	E	3.15	3.30	3.45	L1	0.10	0.20	0.30
c	0.19	0.20	0.22	E1	3.00	3.10	3.20	L2	0	0.10	0.15
D	3.05	3.30	3.45	E2	1.60	1.70	1.80	L3	0.30	0.40	0.50
D1	3.00	3.10	3.20	H	0.31	0.41	0.51	S	10°	12°	14°
D2	2.40	2.50	2.60	K	0.79	0.89	0.99	S1	8°	10°	12°

©2010 Alfa-MOS Technology Corp.
2F, No.80, Sec.1, Cheng Kung Rd., Nan Kang Dist., Taipei City 115, Taiwan (R.O.C.)
Tel : 886 2) 2651 3928
Fax : 886 2) 2786 8483
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