
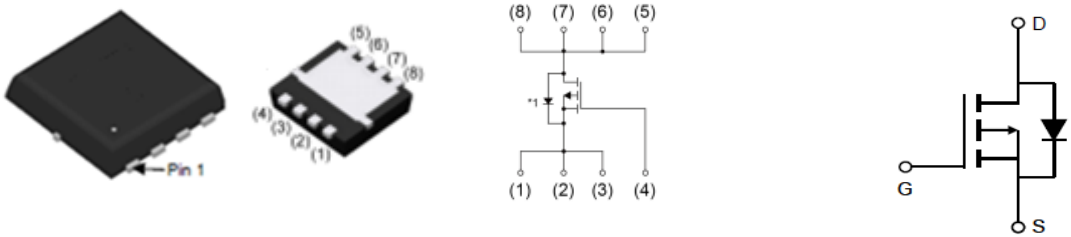
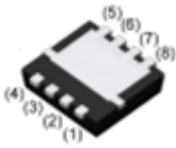
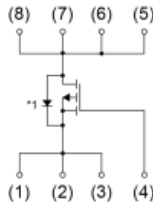
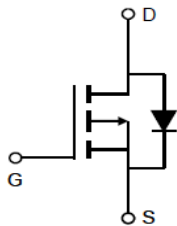




30V P-Channel Trench MOSFET

<p>Features</p> <ul style="list-style-type: none"> ● Trench Power Technology ● Low $R_{DS(ON)}$ ● Low Gate Charge ● Optimized for Fast-switching Applications <p>Applications</p> <ul style="list-style-type: none"> ● Synchronous Rectification in DC/DC and AC/DC Converters ● Isolated DC/DC Converters in Telecom and Industrial 	<p>Product Summary</p> <p>V_{DS} -30V</p> <p>$R_{DS(ON)}$ (at $V_{GS}=10V$) < 7.5mΩ</p> <p>$R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 12mΩ</p> <p>I_D (at $V_{GS}=10V$) -90A</p> <p>100% UIS Tested</p> 	
   		
Device	Package	Marking
TTG90P03AT3	DFN3x3	90P03AT

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted			
Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS} = 0V$)	V_{DSS}	-30	V
Continuous Drain Current	I_D	$T_C = 25^\circ C$	-90
		$T_C = 100^\circ C$	-63
Pulsed Drain Current (note1)	I_{DM}	-360	A
Gate-Source Voltage	V_{GSS}	± 20	V
Single Pulse Avalanche Energy (note2)	E_{AS}	135	mJ
Avalanche Current	I_{AS}	-30	A
Power Dissipation (note3)	P_D	$T_C = 25^\circ C$	79
		$T_C = 100^\circ C$	39.5
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+175	$^\circ C$

Thermal Resistance			
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	R_{thJC}	1.9	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient	R_{thJA}	60	



Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	-1	μA
		$V_{DS} = -30V, V_{GS} = 0V, T_J = 100^\circ\text{C}$	--	--	-25	
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 20V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.7	-2.4	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -20A$	--	6.3	7.5	$m\Omega$
		$V_{GS} = -4.5V, I_D = -20A$	--	10	12	$m\Omega$
Forward Transconductance (Note3)	g_{fs}	$V_{DS} = -5V, I_D = -20A$	30	--	--	S
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0V,$ $V_{DS} = -15V,$ $f = 1.0\text{MHz}$	--	4942	--	pF
Output Capacitance	C_{oss}		--	473	--	
Reverse Transfer Capacitance	C_{rss}		--	461	--	
Total Gate Charge	Q_g	$V_{DD} = -15V, I_D = -20A,$ $V_{GS} = -10V$	--	82	--	nC
Gate-Source Charge	Q_{gs}		--	14	--	
Gate-Drain Charge	Q_{gd}		--	16	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -15V, I_D = -20A,$ $R_G = 2.5\Omega$	--	182	--	ns
Turn-on Rise Time	t_r		--	262	--	
Turn-off Delay Time	$t_{d(off)}$		--	13	--	
Turn-off Fall Time	t_f		--	9.8	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	-90	A
Pulsed Diode Forward Current	I_{SM}		--	--	-360	
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{SD} = -15A, V_{GS} = 0V$	--	--	-1.2	V
Reverse Recovery Time	t_{rr}	$I_F = -15A,$ $di_F/dt = 100A/\mu s$	--	34	--	ns
Reverse Recovery Charge	Q_{rr}		--	79	--	nC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS} = -30A, L=0.3mH, V_{DD} = 30V, R_G = 25\Omega,$ Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu s,$ Duty Cycle $\leq 1\%$



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

Figure 1. Output Characteristics

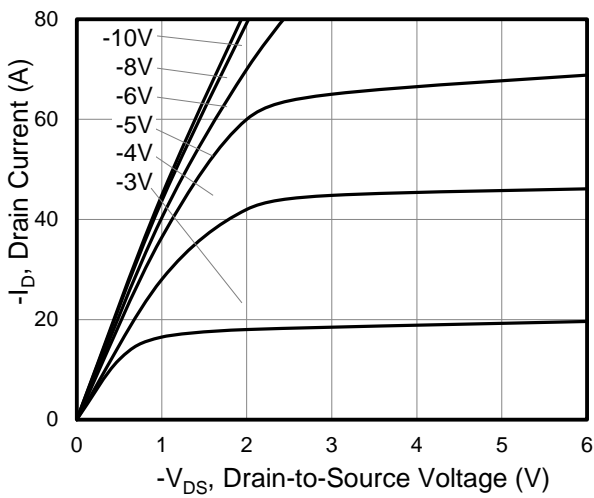


Figure 2. Transfer Characteristics

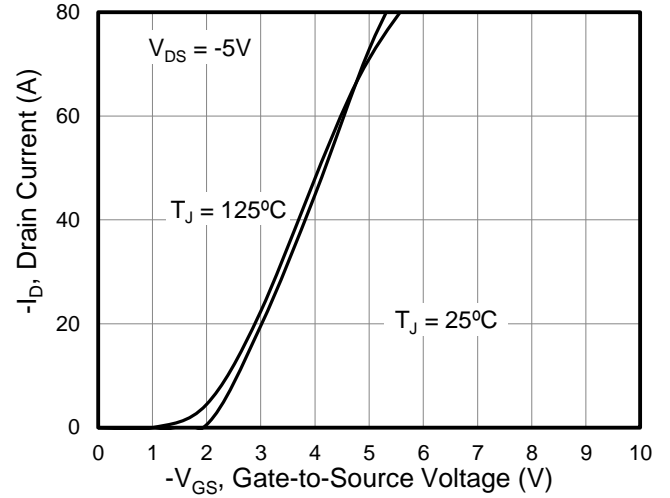


Figure 3. On-Resistance vs. Drain Current

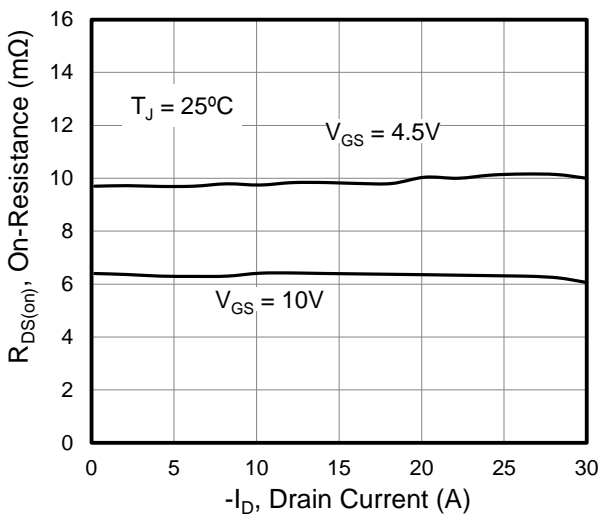


Figure 4. Capacitance

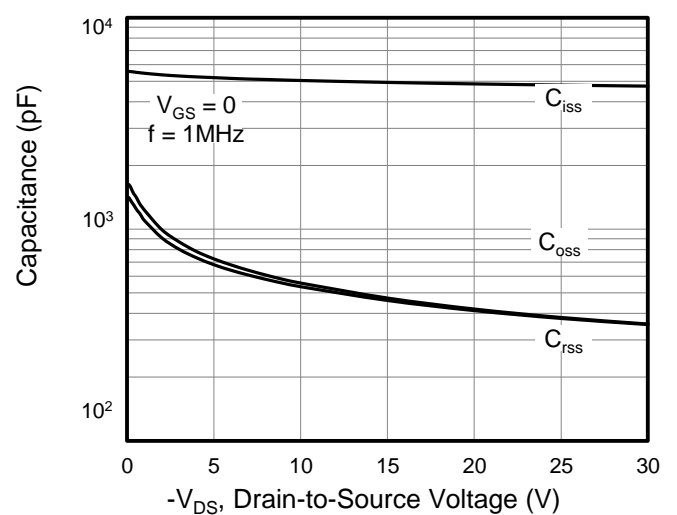


Figure 5. Gate Charge

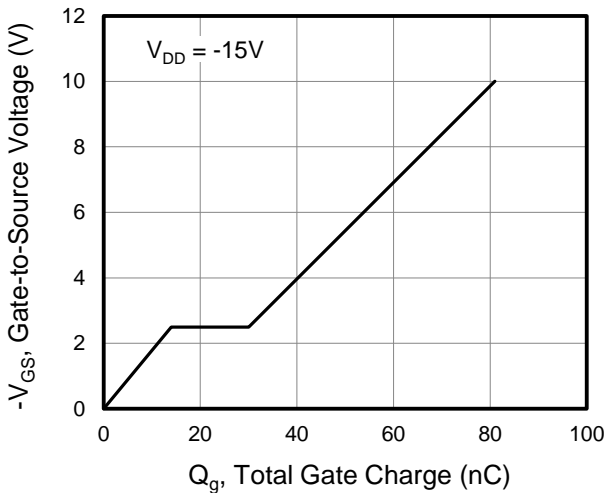
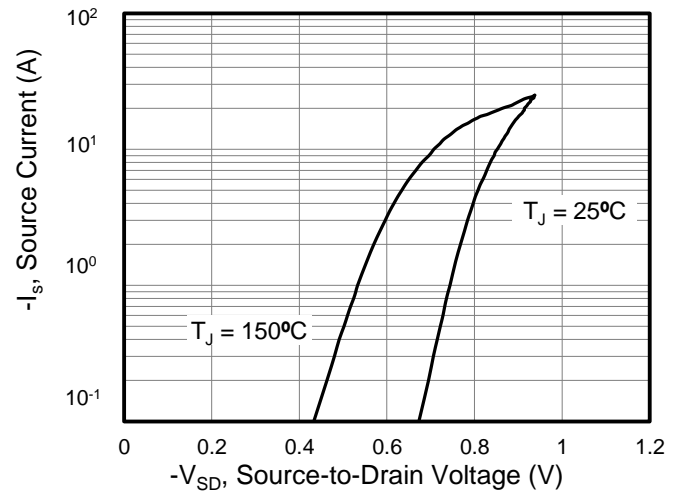


Figure 6. Body Diode Forward Voltage





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

Figure 7. On-Resistance vs. Junction Temperature

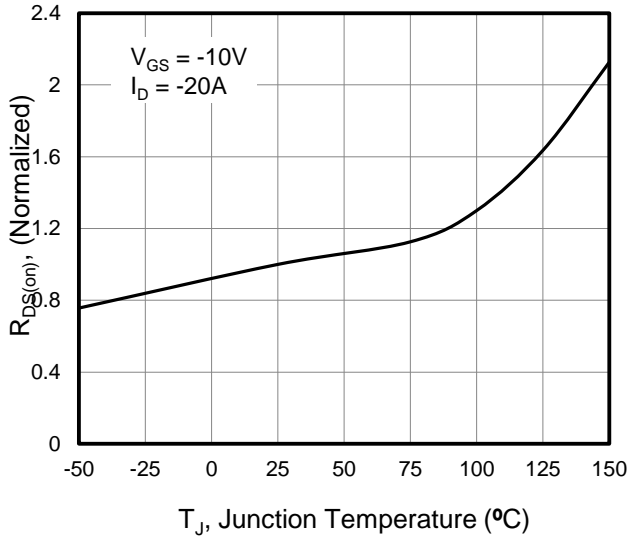


Figure 8. Threshold Voltage vs. Junction Temperature

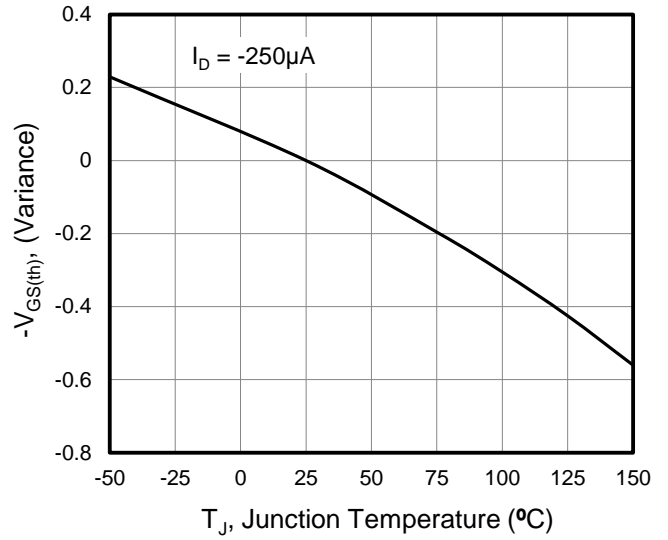


Figure 9. Transient Thermal Impedance

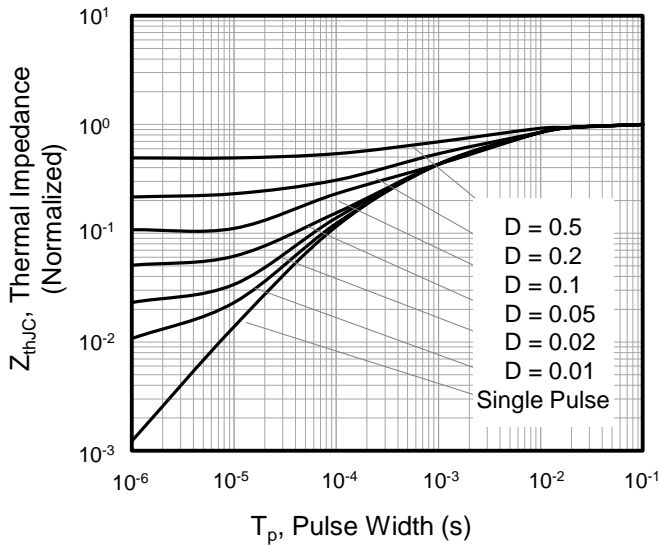


Figure 10. Safe operation area

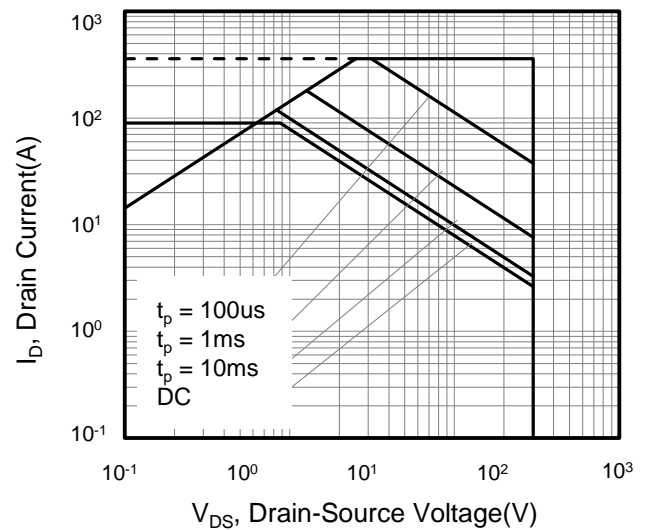




Figure A: Gate Charge Test Circuit and Waveform

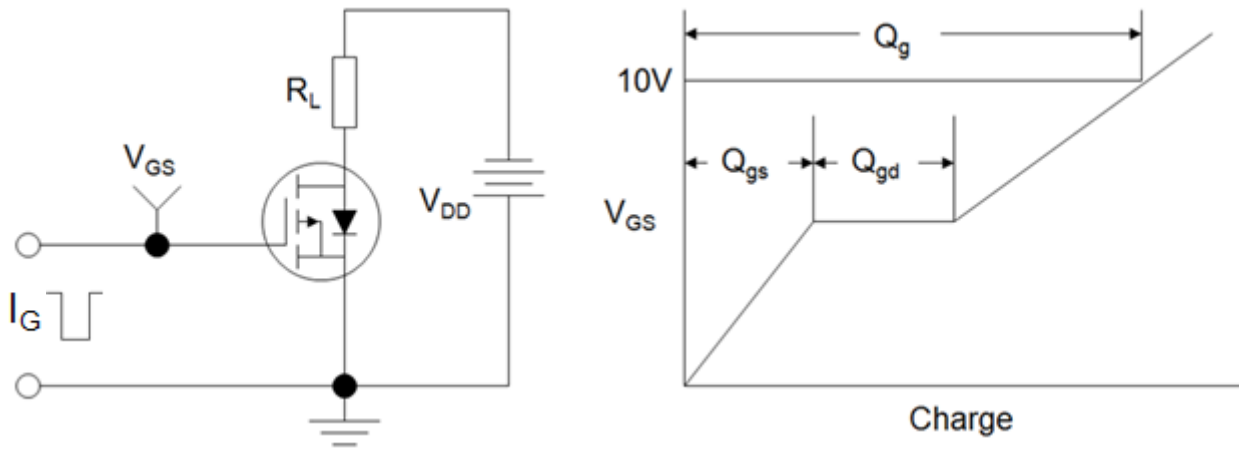


Figure B: Resistive Switching Test Circuit and Waveform

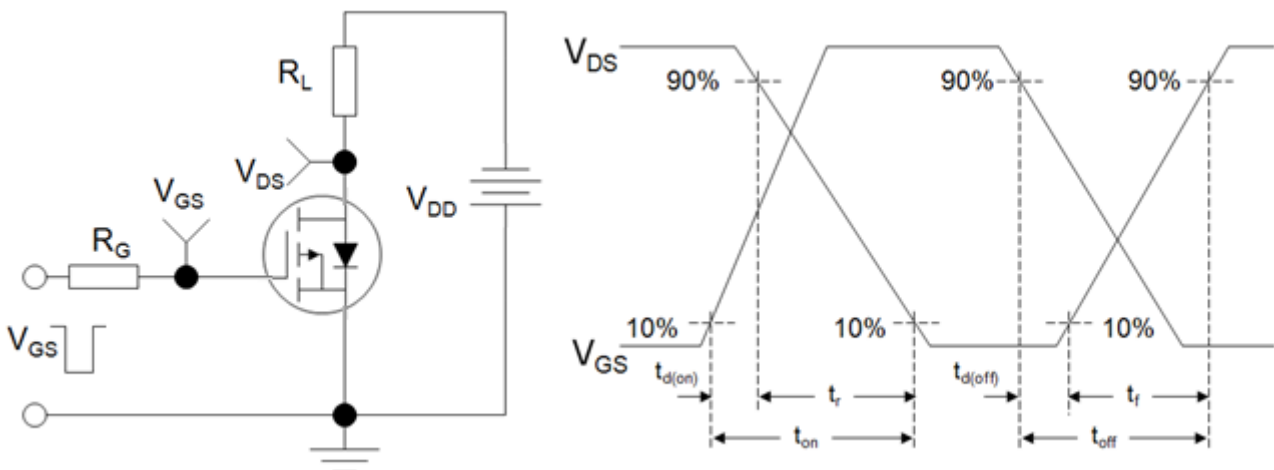
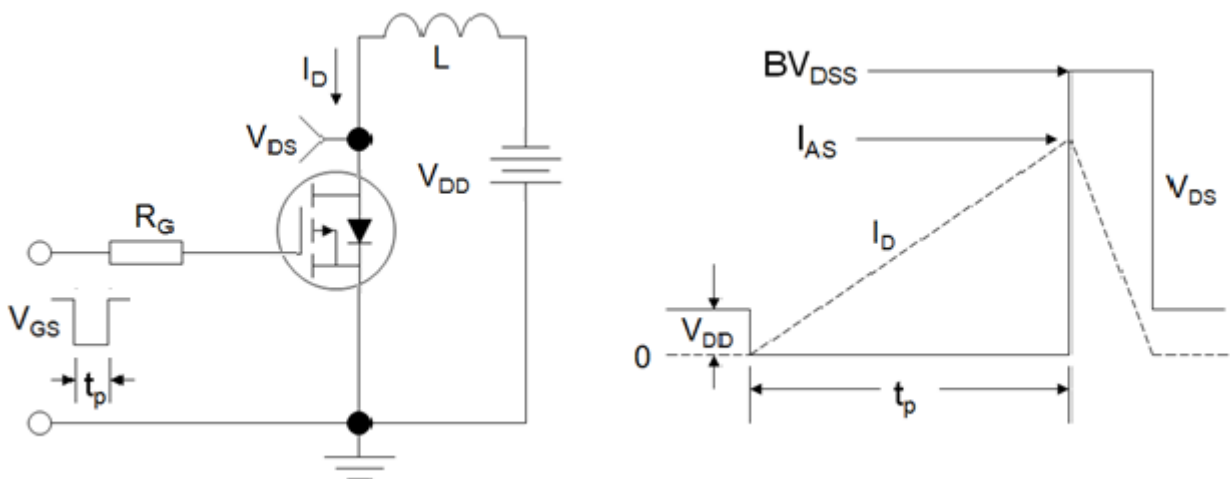
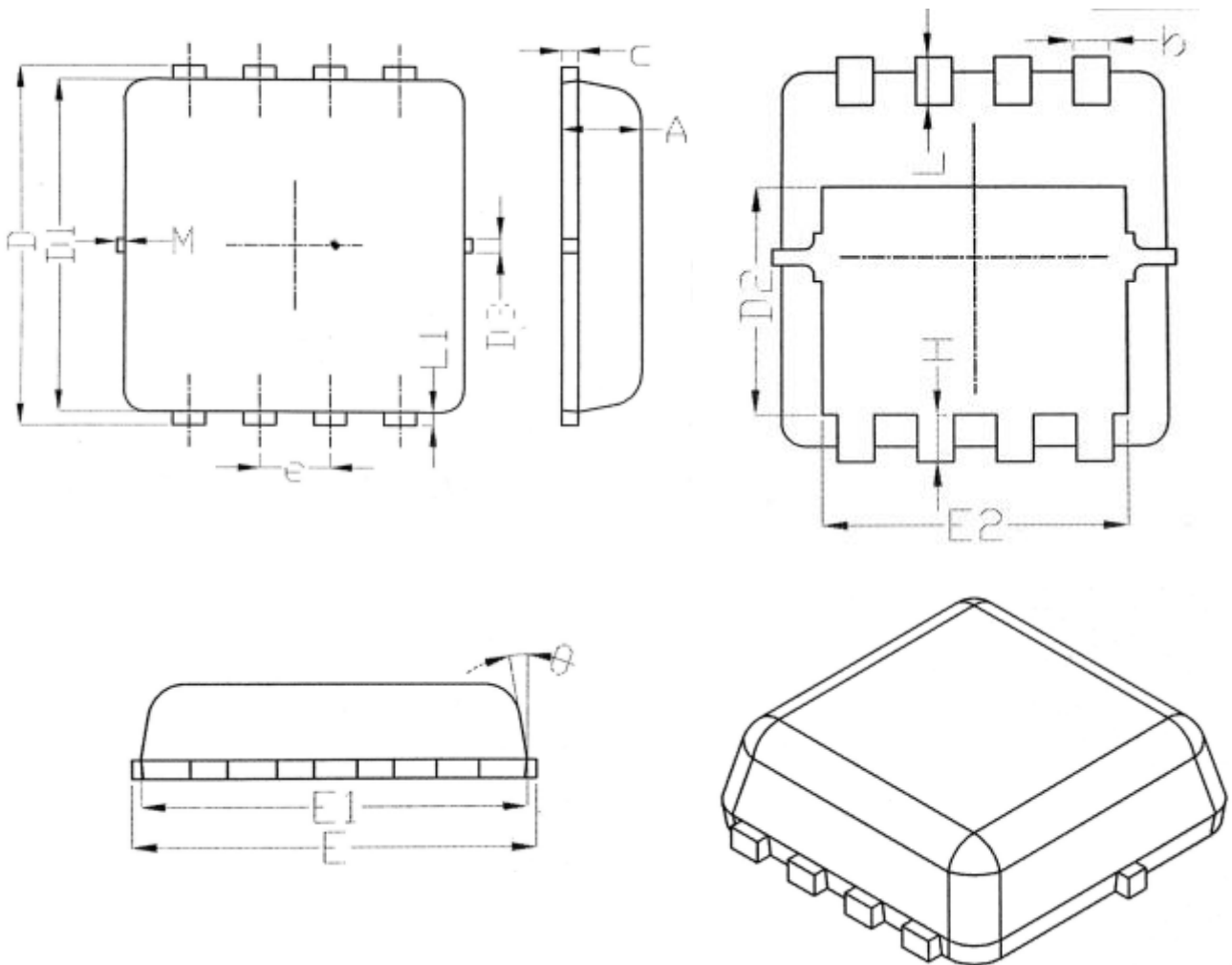


Figure C: Unclamped Inductive Switching Test Circuit and Waveform

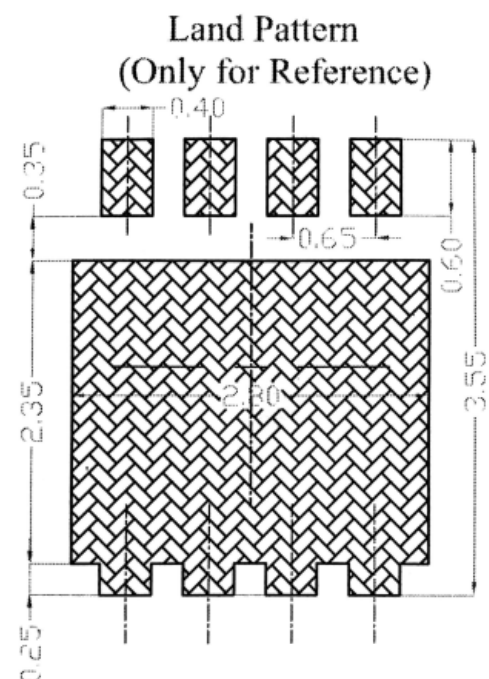




DFN3x3



SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
θ	---	10°	12°
M	*	*	0.15
* Not specified			





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