

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology
- ★ 100% EAS Guaranteed

Product Summary

RoHS

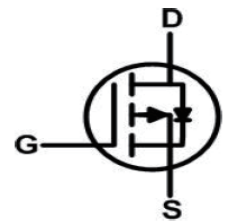
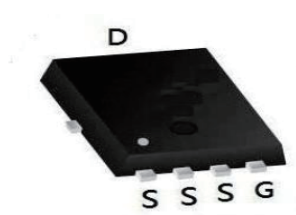
BVDSS	RDS(on)	ID
-30V	15mΩ	-30A

Description

The 30P03D is the high cell density trenched P-ch MOSFETs, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications.

The 30P03D meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

PDFN3*3 Pin Configuration



Absolute Maximum Ratings (TA=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V _{DS}	Drain-Source voltage	-30	V
V _{GS}	Gate-Source voltage	±20	V
I _D	Continuous Drain Current	T _A =25°C	-30
		T _A =100°C	-15.8
I _{DM}	Pulsed Drain Current ₁	-100	A
EAS	Single Pulse Avalanche Energy ₂	26.5	mJ
P _D	Total Power Dissipation	T _A =25°C 22	W
T _J , T _{STG}	Operating Junction and Storage Temperature	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Units
R _{θJA}	Thermal Resistance Junction-Ambient ³	---	79	°C/W
R _{θJC}	Thermal Resistance Junction-Case	---	5.7	°C/W

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

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Units
Static Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	-30	-	-	V
I_{GSS}	Gate-body Leakage current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$T_J = 25^\circ\text{C}$	-	-	-1	
		$T_J = 100^\circ\text{C}$	-	-	-100	μA
$V_{GS(th)}$	Gate-Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.5	-2.5	V
$R_{DS(on)}$	Drain-Source On-Resistance ⁴	$V_{GS} = -10V, I_D = -10A$	-	15	20	
		$V_{GS} = -4.5V, I_D = -6A$	-	22.5	30	$m\Omega$
g_{fs}	Forward Transconductance ⁴	$V_{DS} = -10V, I_D = -10A$	-	23.5	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1MHz$	-	980	-	μF
C_{oss}	Output Capacitance		-	137	-	
C_{riss}	Reverse Transfer Capacitance		-	113	-	
R_g	Gate Resistance	$f = 1MHz$	-	10.5	-	Ω
Switching Characteristics						
Q_g	Total Gate Charge	$V_{GS} = -10V, V_{DS} = -15V,$ $I_D = -10A$	-	20	-	nC
Q_{gs}	Gate-Source Charge		-	3	-	
Q_{gd}	Gate-Drain Charge		-	5.5	-	
$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = -10V, V_{DD} = -15V,$ $R_G = 3\Omega, I_D = -10A$	-	7.5	-	ns
t_r	Rise Time		-	16	-	
$t_{d(off)}$	Turn-Off Delay Time		-	49	-	
t_f	Fall Time		-	32	-	
t_{rr}	Body Diode Reverse Recovery Time	$I_F = -10A,$	-	21	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$dI_F/dt = 100A/\mu s$	-	12.5	-	nC
Drain-Source Body Diode Characteristics						
V_{SD}	Diode Forward Voltage ⁴	$I_S = -10A, V_{GS} = 0V$	-	-	-1.2	V
I_S	Continuous Source Current	$T_C = 25^\circ\text{C}$	-	-	-30	A

Note :

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$.
2. The EAS data shows Max. rating . The test condition is $V_{DD} = -25V, V_{GS} = -10V, L = 0.1mH, I_{AS} = -23A$.
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Performance Characteristics

Figure 1: Output Characteristics

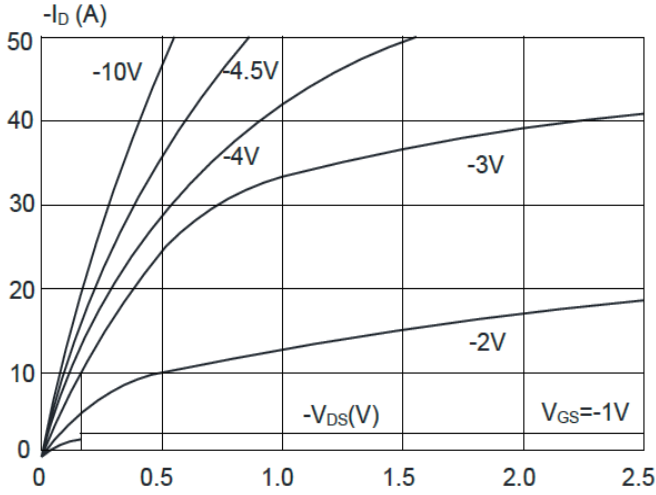


Figure 2: Typical Transfer Characteristics

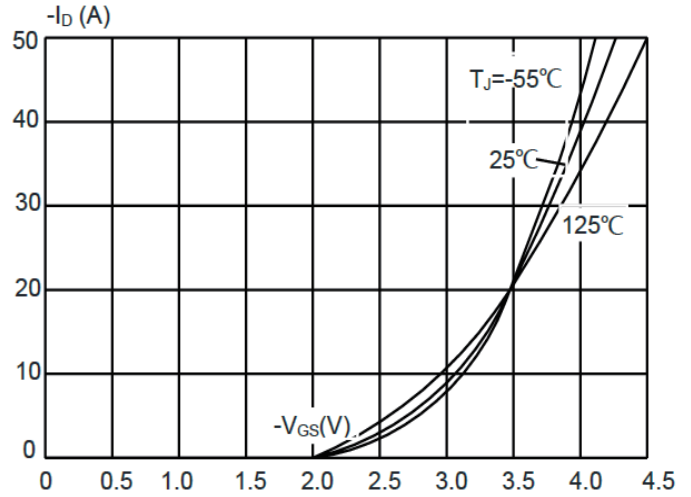


Figure 3: On-resistance vs. Drain Current

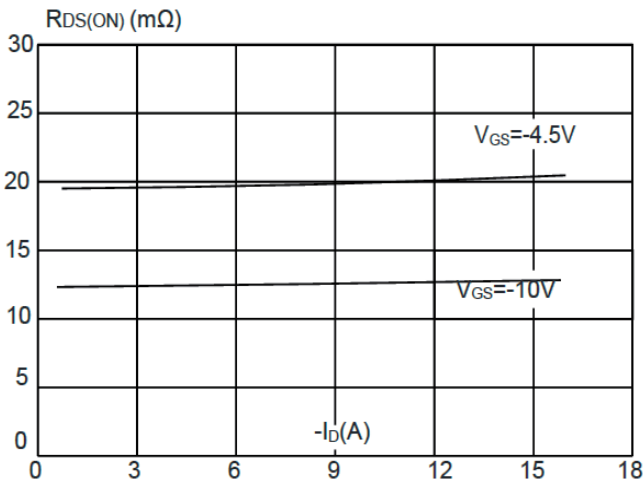


Figure 4: Body Diode Characteristics

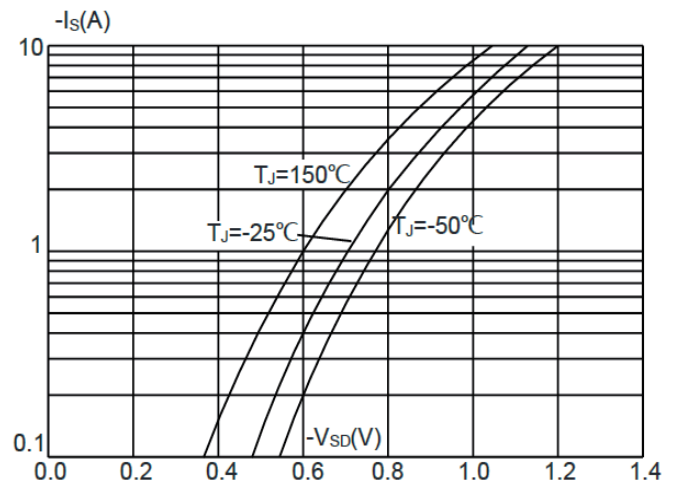


Figure 5: Gate Charge Characteristics

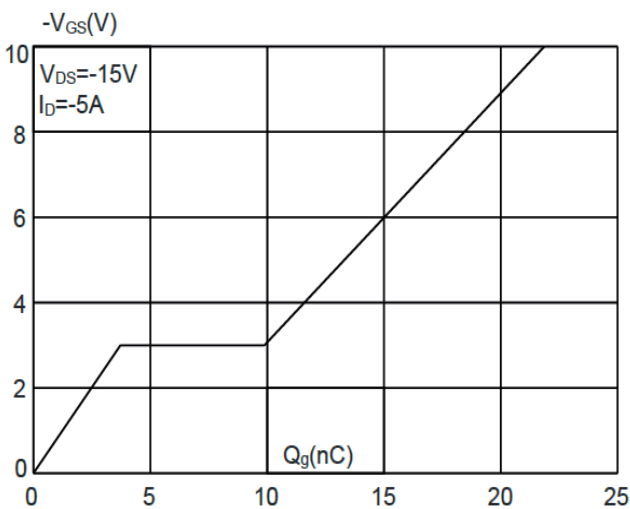
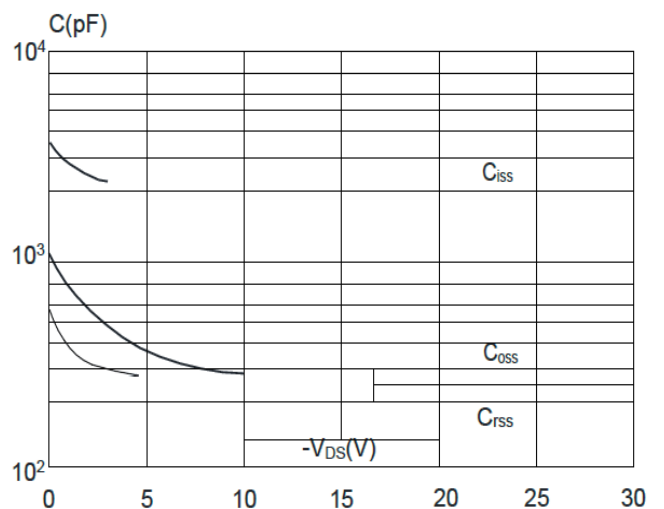


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Capacitance Characteristics

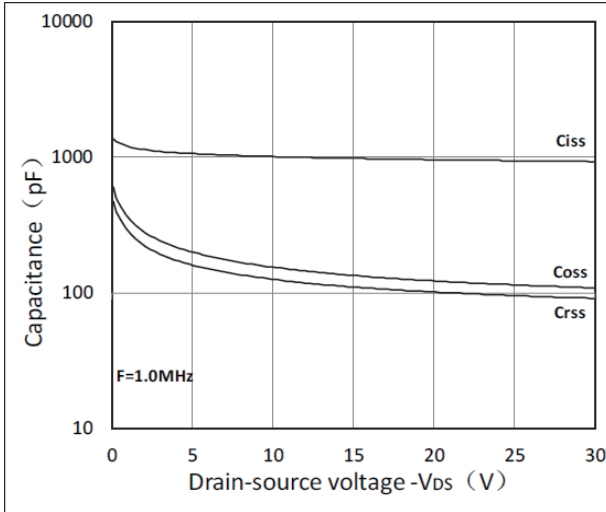


Figure 8: Gate Charge Characteristics

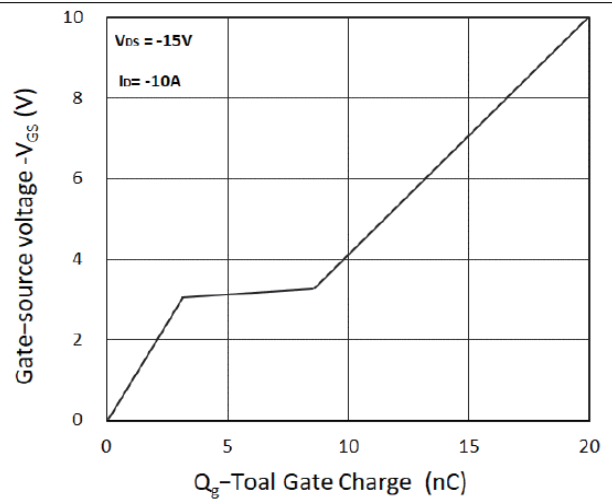


Figure 9: Power Dissipation

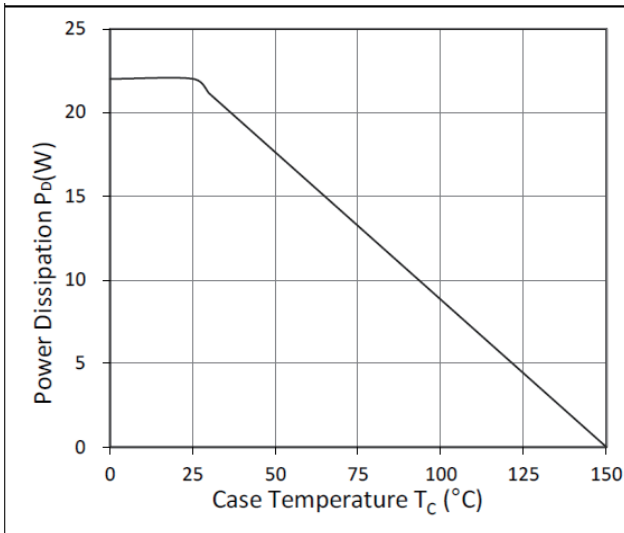


Figure 10: Safe Operating Area

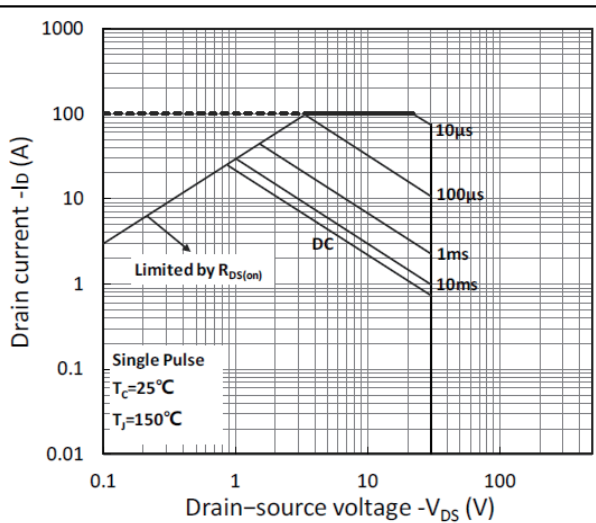
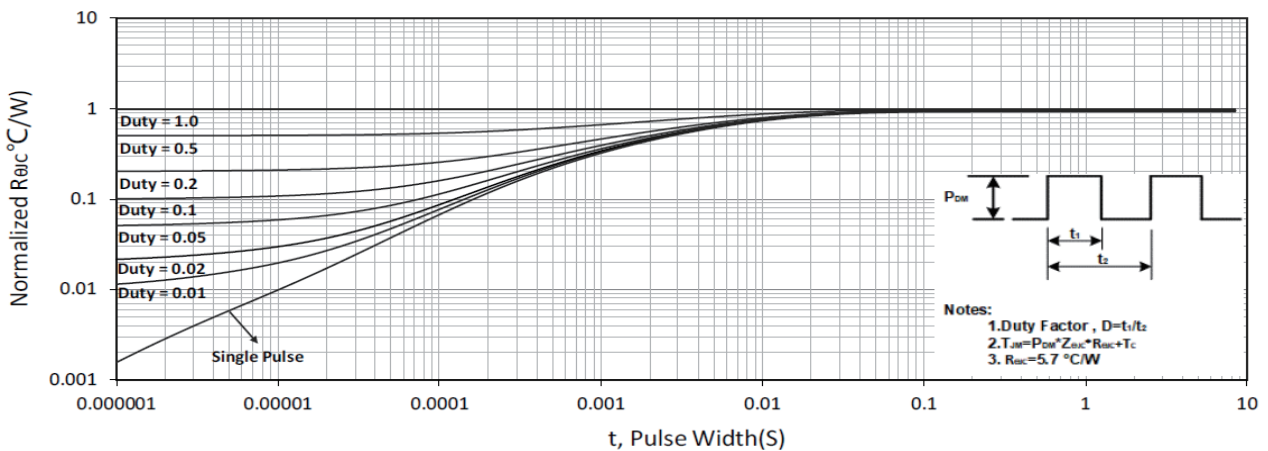
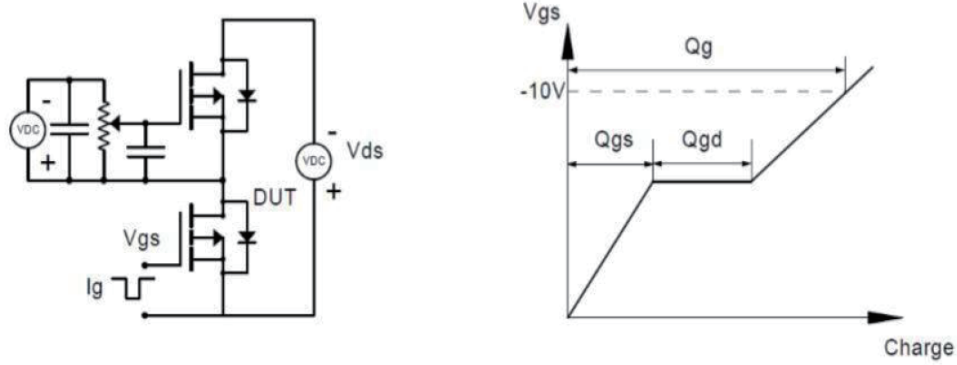


Figure 11: Normalized Maximum Transient Thermal Impedance

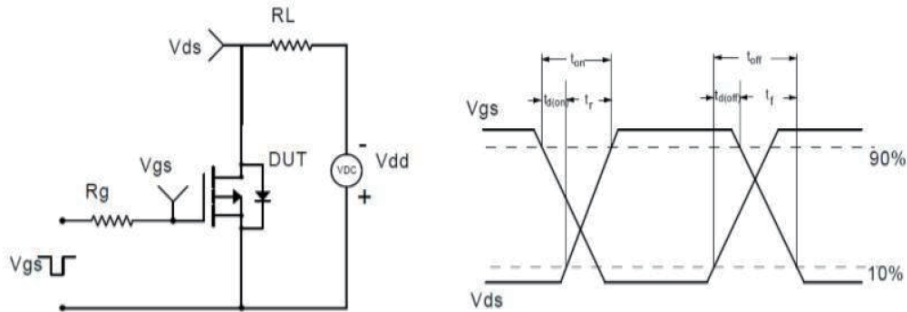


Test Circuit

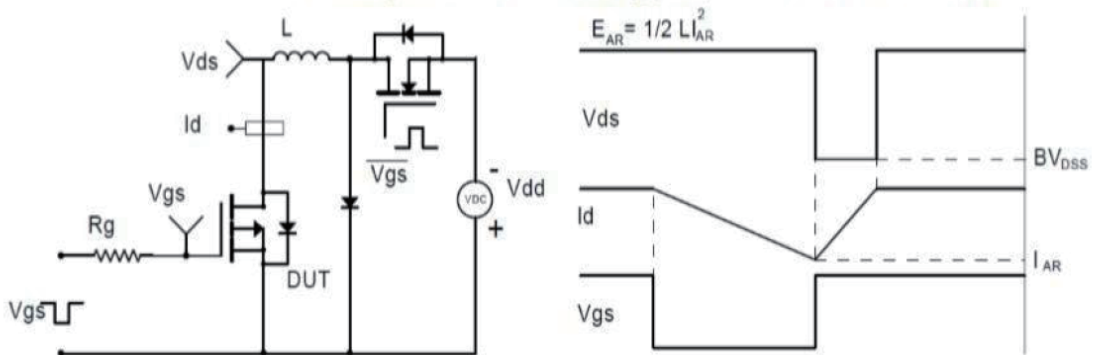
Gate Charge Test Circuit & Waveform



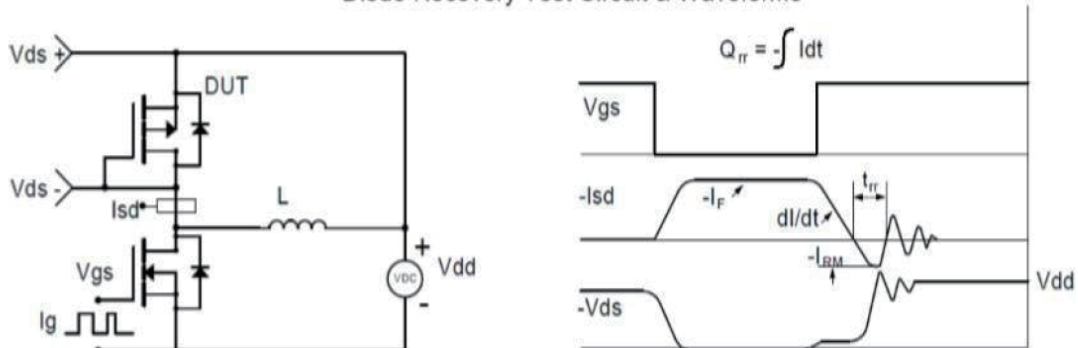
Resistive Switching Test Circuit & Waveforms

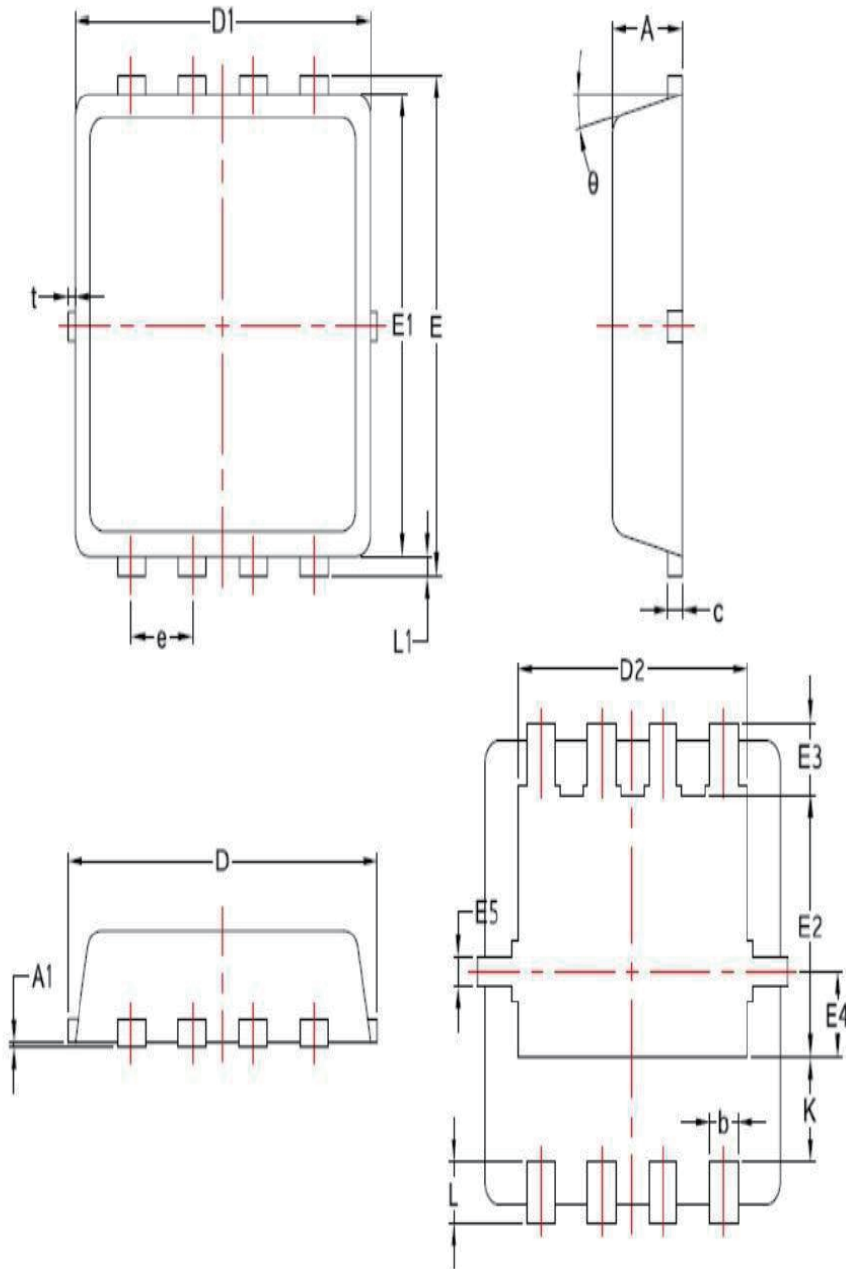


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms





SYMBOL	COMMON		
	MM		
	MIN	NOM	MAX
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
θ	10°	12°	14°

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