N-Channel 30V, 2.6mΩ Typ. Power MOSFET

Description

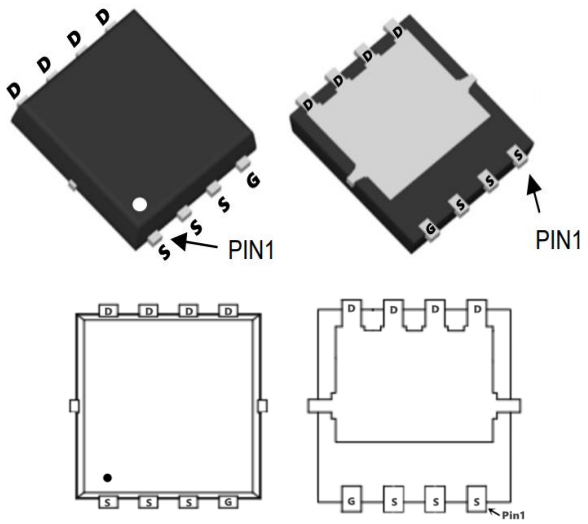
Features

- 30V, 100A

  $R_{DS(ON)}$ Typ = 2.6mΩ @ V_{GS} = 10V

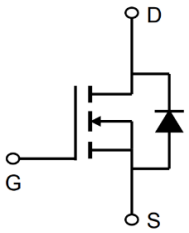
  $R_{DS(ON)}$ Typ = 3.8mΩ @ V_{GS} = 4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS TESTED!
- 100% ΔVds TESTED!

PDFN5*6-8L



Application

- Load Switch
- PWM Application
- Power Management



Package Marking and Ordering Information

Device	Marking	Package	Outline	Reel Size	Reel (pcs)	Per Carton (pcs)
CTKT100N03DF5	CTKT100N03DF5	PDFN5x6-8L	TAPING	13"	5000	50000

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

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		30	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	100	A
		T_C = 100°C	60	A
I_{DM}	Pulsed Drain Current (1)		400	A
E_{AS}	Single Pulsed Avalanche Energy (2)		156	mJ
P_D	Power Dissipation	T_C = 25°C	56.8	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		2.2	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.1	1.6	2.1	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 10V, I_D = 20A	-	2.6	3.4	mΩ
		V_{GS} = 4.5V, I_D = 10A	-	3.8	5.0	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz	-	3154	-	pF
C_{oss}	Output Capacitance		-	372	-	pF
C_{rss}	Reverse Transfer Capacitance		-	306	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 15V, I_D = 30A	-	58	-	nC
Q_{gs}	Gate Source Charge		-	12	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	13	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 15V I_D= 30A, R_{GEN} = 3Ω	-	11	-	ns
t_r	Turn-On Rise Time		-	29	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	47	-	ns
t_f	Turn-Off Fall Time		-	18	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	100	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	400	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 30A, di/dt = 100A/us	-	16	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	7	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E_{AS} condition: Starting T_J=25°C, V_{DD}=15V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=25A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Typical Performance Characteristics

Figure 1: Output Characteristics

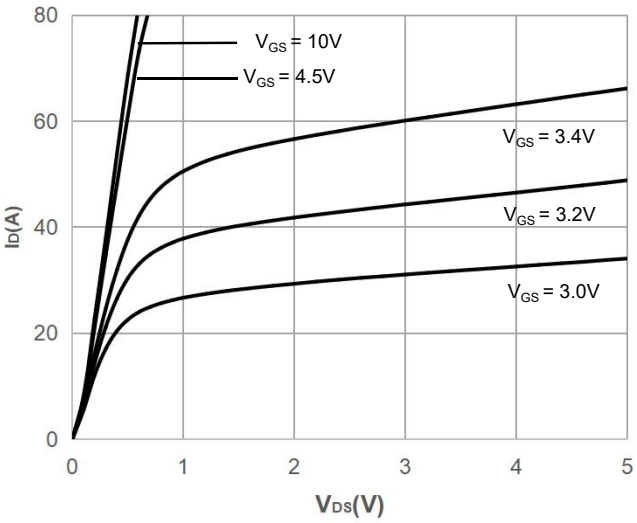


Figure 2: Typical Transfer Characteristics

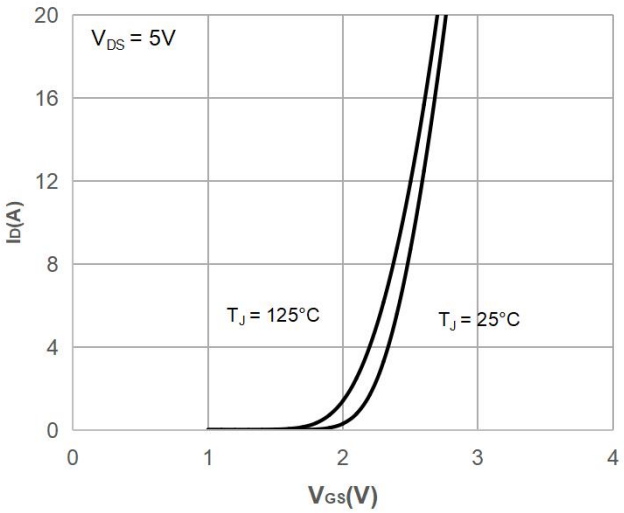


Figure 3: On-resistance vs. Drain Current

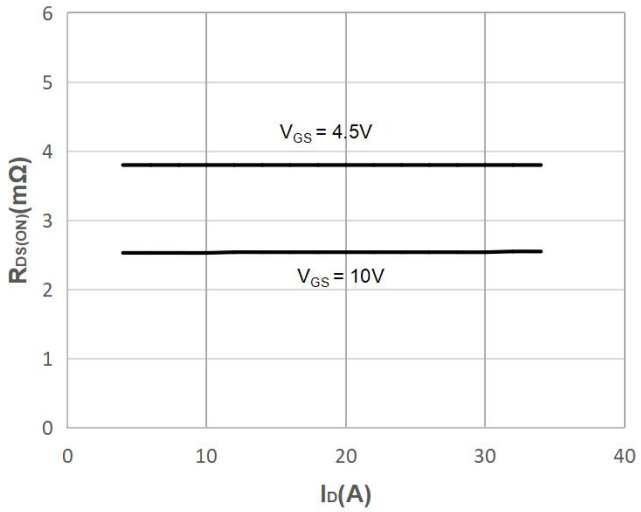


Figure 4: Body Diode Characteristics

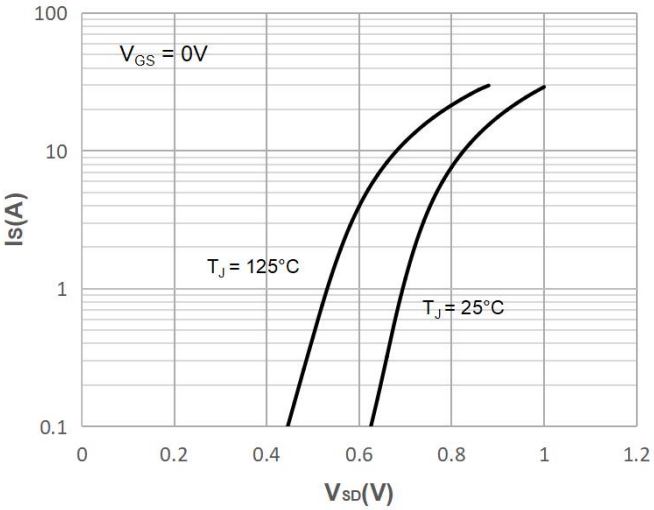


Figure 5: Gate Charge Characteristics

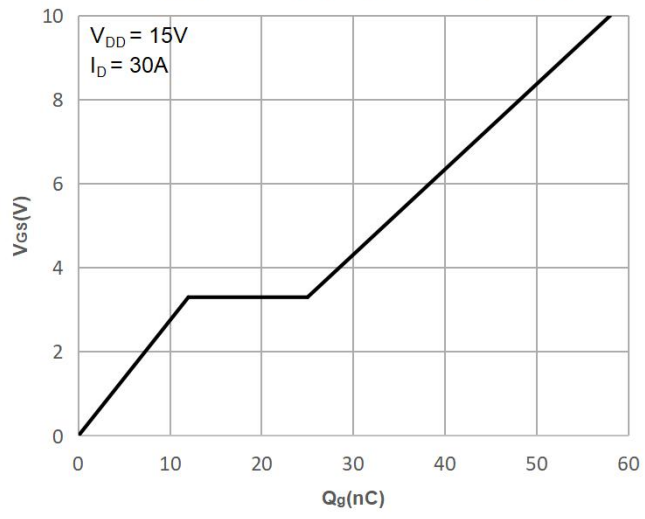
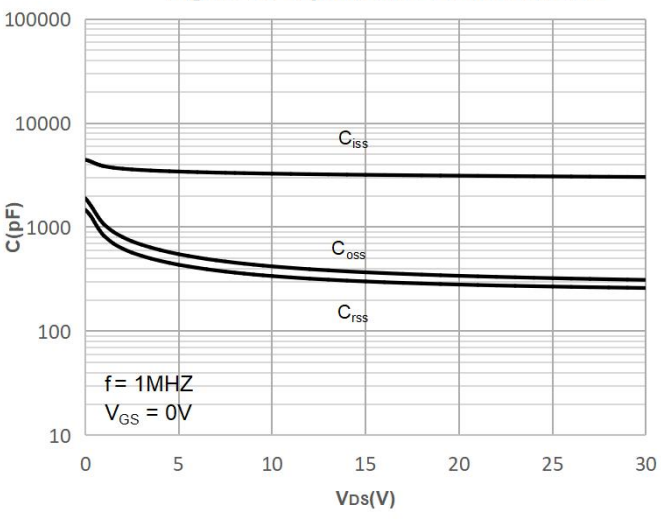


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

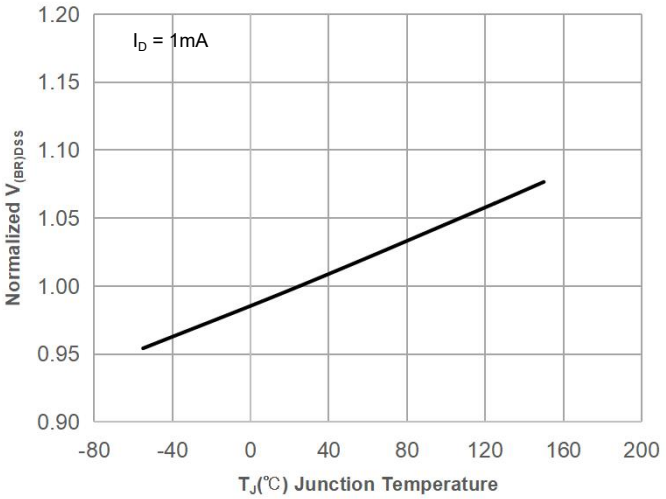


Figure 8: Normalized on Resistance vs. Junction Temperature

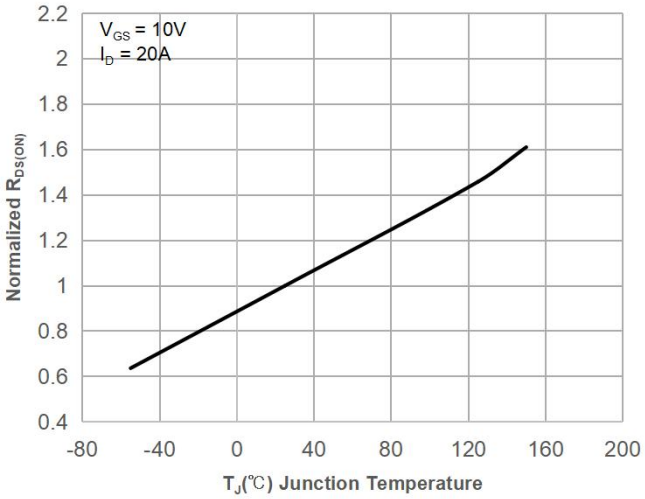


Figure 9: Maximum Safe Operating Area

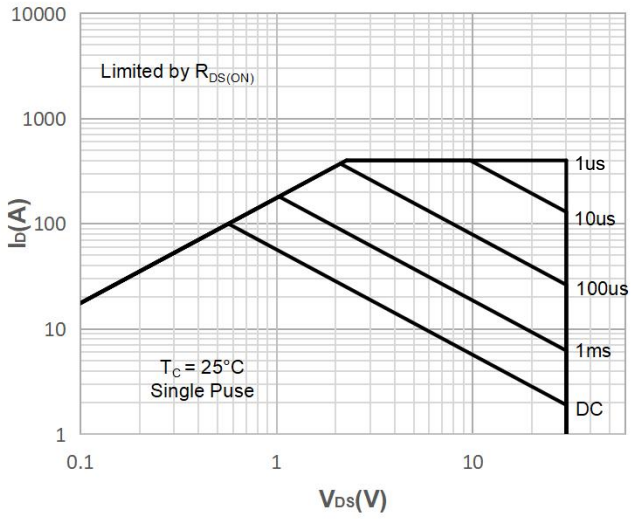


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

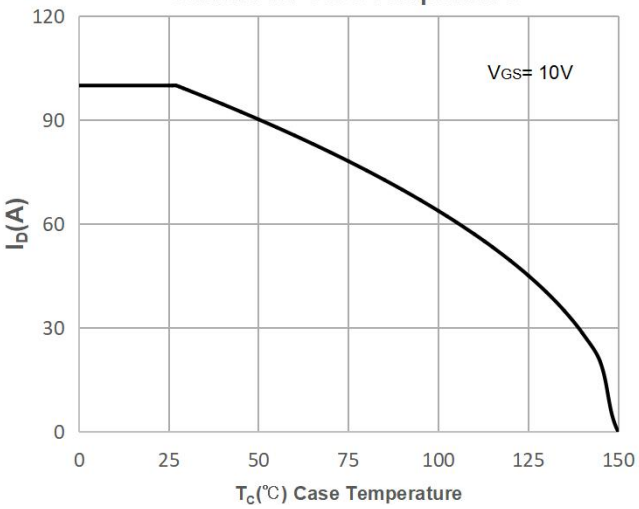


Figure 11: Normalized Maximum Transient Thermal Impedance

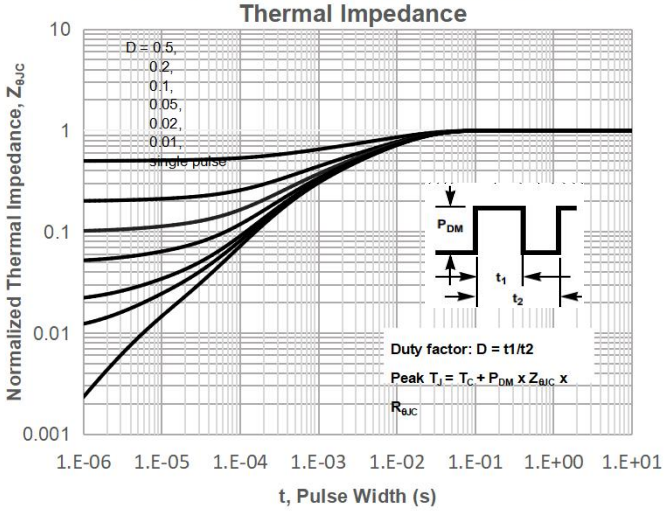
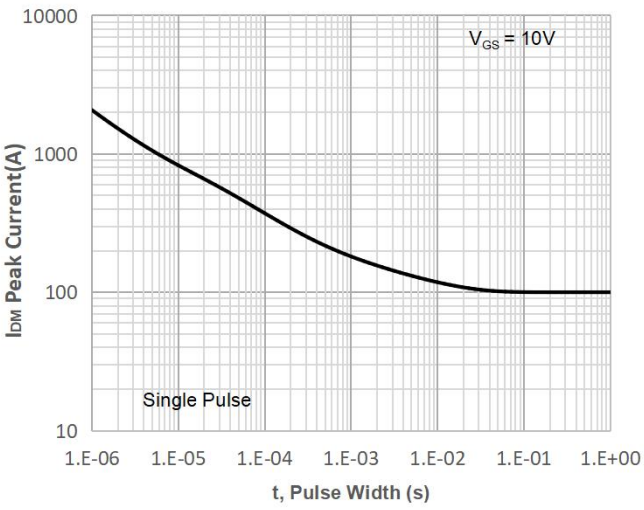


Figure 12: Peak Current Capacity



Test Circuit

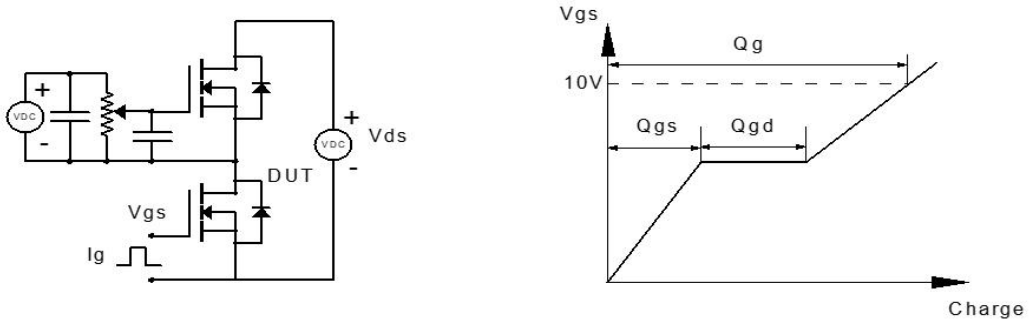


Figure 1: Gate Charge Test Circuit & Waveform

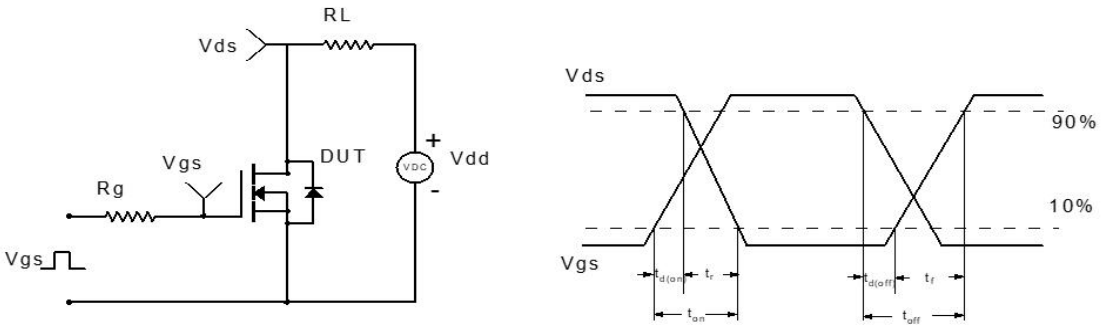


Figure 2: Resistive Switching Test Circuit & Waveform

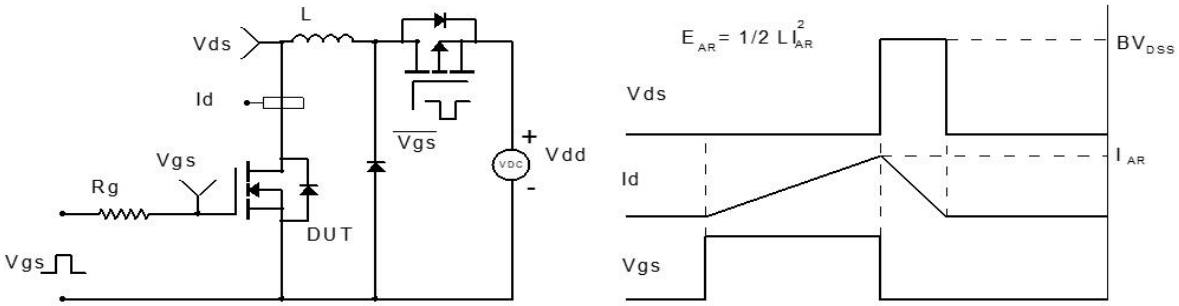


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

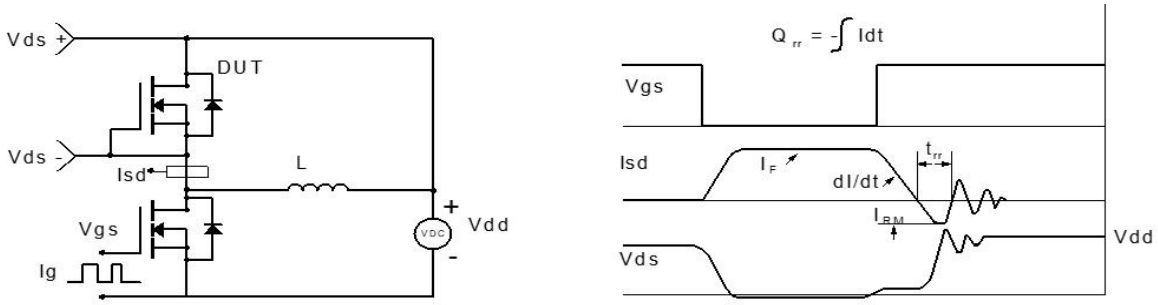
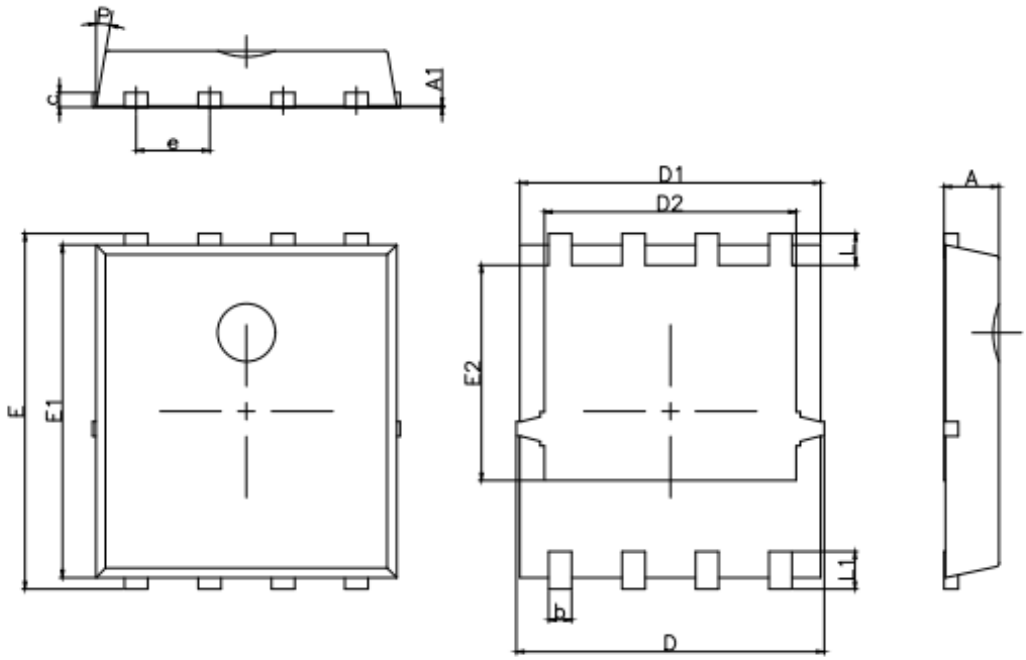


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data-PDFN5*6-8L



DIM.	MILLIMETER		
	MIN.	TYP.	MAX.
A	0.9	0.95	1.2
A1	0	0.025	0.05
b	0.26	0.4	0.54
c	0.15	0.25	0.35
D	5.0	5.3	5.45
D1	4.95	5.15	5.35
D2	4.0	4.35	4.5
E	6.05	6.15	6.25
E1	5.7	5.75	6.1
E2	3.4	3.7	3.8
e		1.27	
L	0.45	0.55	0.65
L1	0.45	0.6	0.7
P	8°	10°	12°