

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

Product Summary



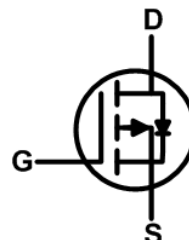
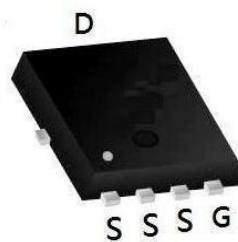
BVDSS	RDS(on)	ID
-100V	70mΩ	-25A

Description

The UD20P10F is the high cell density trench P-ch MOSFETs, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications.

The UD20P10F meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

PDFN5060-8L Pin Configuration



Absolute Maximum Ratings (T_A = 25°C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V _{DS}	-100	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	T _C = 25°C	I _D	-20	A
	T _C = 100°C		-11	
Pulsed Drain Current ¹		I _{DM}	-72	A
Single Pulse Avalanche Energy ²		EAS	42	mJ
Total Power Dissipation	T _C = 25°C	P _D	102	W
Operating Junction and Storage Temperature Range		T _J , T _{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	R _{θJA}	91	°C/W
Thermal Resistance from Junction-to-Case	R _{θJC}	1.22	°C/W

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

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-100	-	-	V
Gate-body Leakage current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J = 25°C	I _{DSS}	V _{DS} = -100V, V _{GS} = 0V	-	-	-1	μA
	T _J = 100°C			-	-	-20	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.5	-2	-2.5	V
Drain-Source On-Resistance ⁴		R _{DS(on)}	V _{GS} = -10V, I _D = -10A	-	70	88	mΩ
			V _{GS} = -4.5V, I _D = -6A		77	97	
Forward Transconductance ⁴		g _{fs}	V _{DS} = -10V, I _D = -10A	-	28	-	S
Dynamic Characteristics ⁵							
Input Capacitance		C _{iss}	V _{DS} = -50V, V _{GS} = 0V, f = 1MHz	-	2859	-	pF
Output Capacitance		C _{oss}		-	93	-	
Reverse Transfer Capacitance		C _{rss}		-	68	-	
Gate Resistance		R _g	f = 1MHz	-	4.3	-	Ω
Switching Characteristics ⁵							
Total Gate Charge		Q _g	V _{GS} = -10V, V _{DS} = -50V, I _D = -10A	-	53	-	nC
Gate-Source Charge		Q _{gs}		-	12	-	
Gate-Drain Charge		Q _{gd}		-	10	-	
Turn-On Delay Time		t _{d(on)}	V _{GS} = -10V, V _{DD} = -50V, R _G = 3Ω, I _D = -10A	-	8	-	ns
Rise Time		t _r		-	27	-	
Turn-Off Delay Time		t _{d(off)}		-	155	-	
Fall Time		t _f		-	77	-	
Body Diode Reverse Recovery Time		t _{rr}	I _F = -10A, dI/dt= 100A/μs	-	36	-	ns
Body Diode Reverse Recovery Charge		Q _{rr}		-	40	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴		V _{SD}	I _S = -10A, V _{GS} = 0V	-	-0.9	-1.3	V
Continuous Source Current	T _C = 25°C	I _S	-	-	-	20	A

Notes:

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 $V_{DD} = -35V, V_{GS} = -10V, L = 0.5\text{mH}, I_{AS} = -23A$
3. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z 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

Fig 1: Output Characteristics

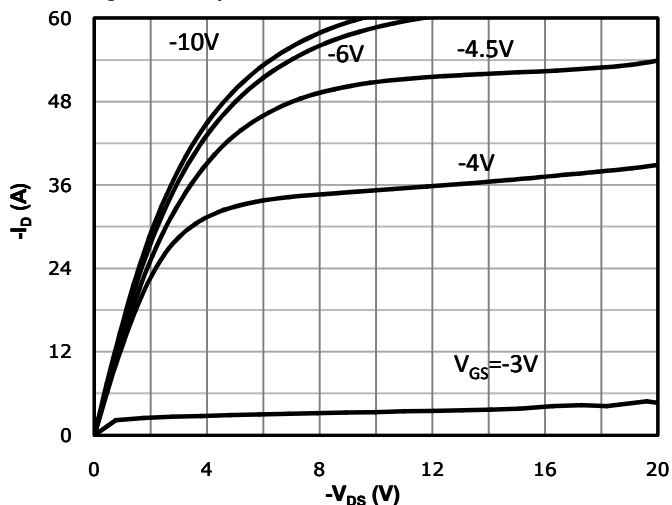


Fig 2: Transfer Characteristics

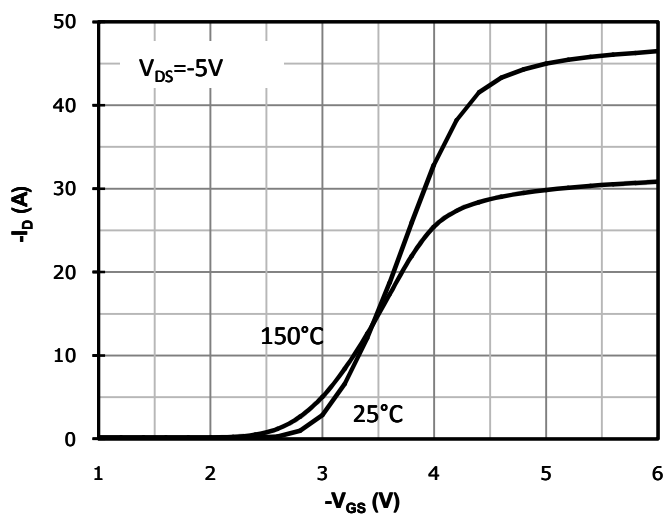


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

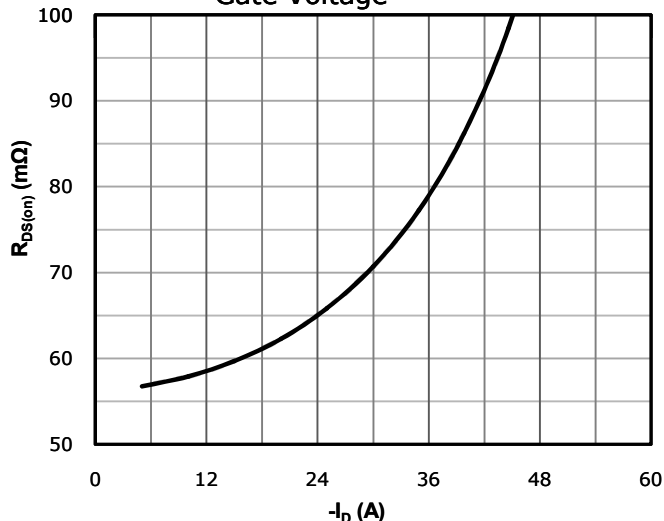


Fig 4: $R_{DS(on)}$ vs Gate Voltage

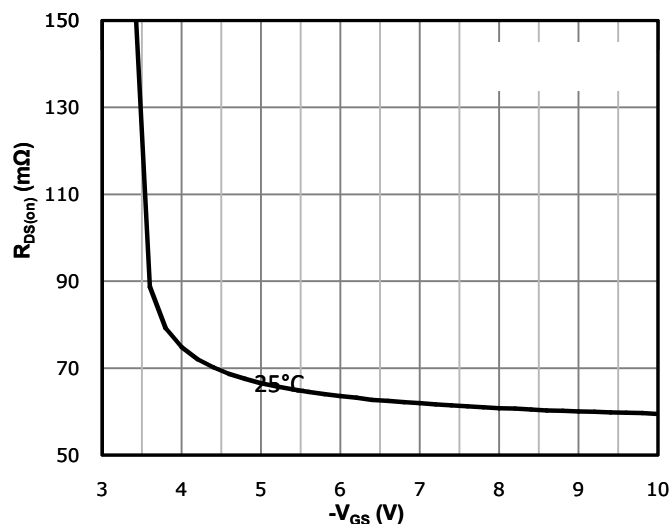


Fig 5: $R_{DS(on)}$ vs. Temperature

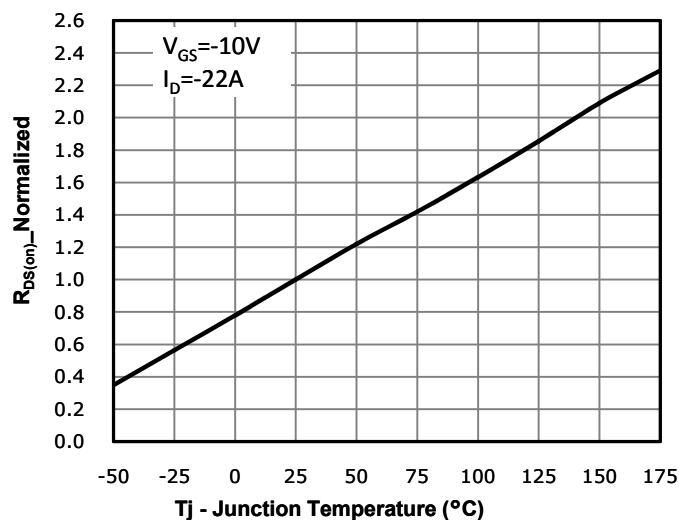


Fig 6: Capacitance Characteristics

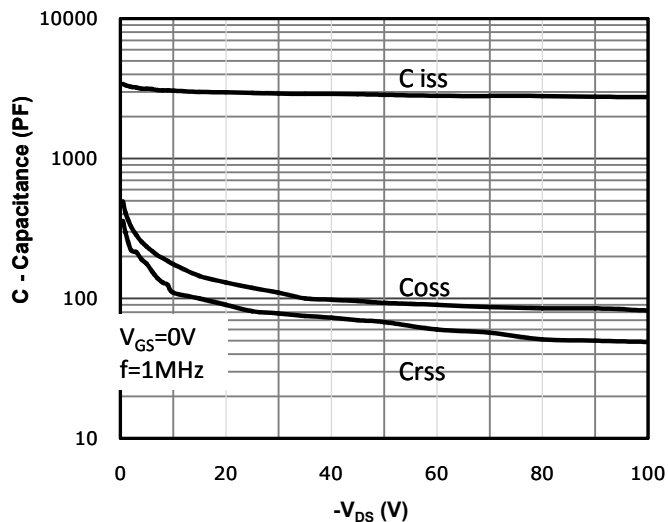


Fig 7: Gate Charge Characteristics

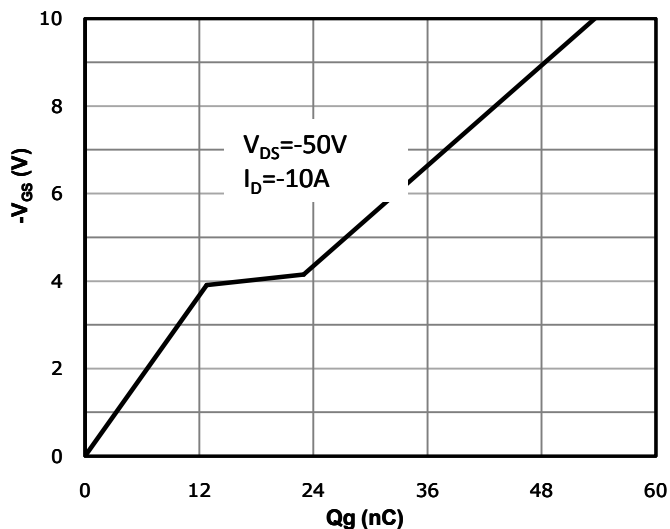


Fig 8: Body-diode Forward Characteristics

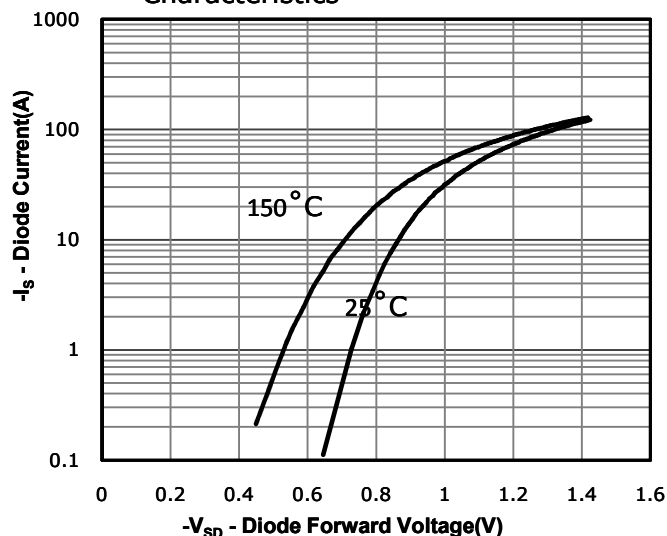


Fig 9: Power Dissipation

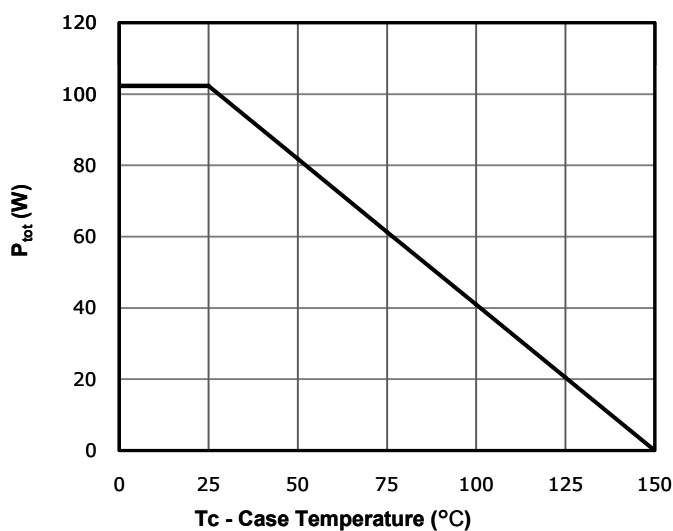


Fig 10: Drain Current Derating

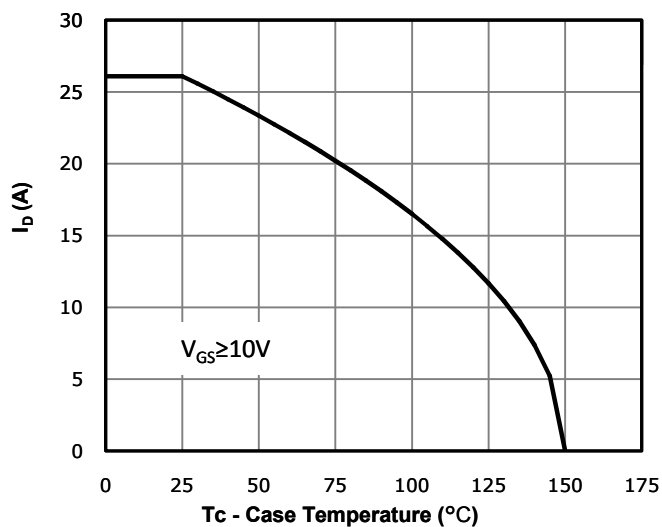


Fig 11: Safe Operating Area

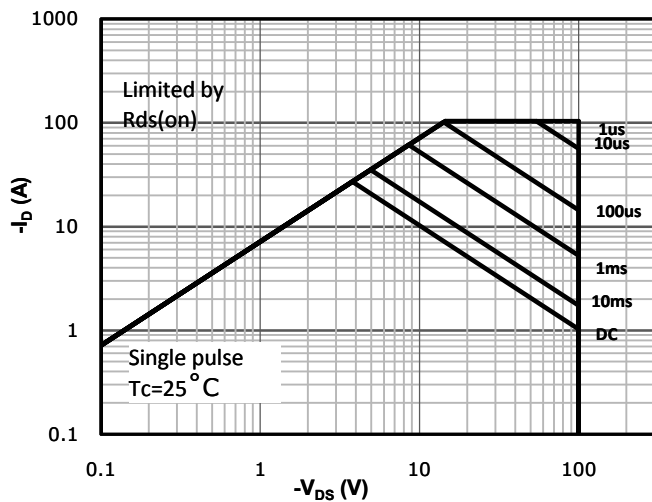
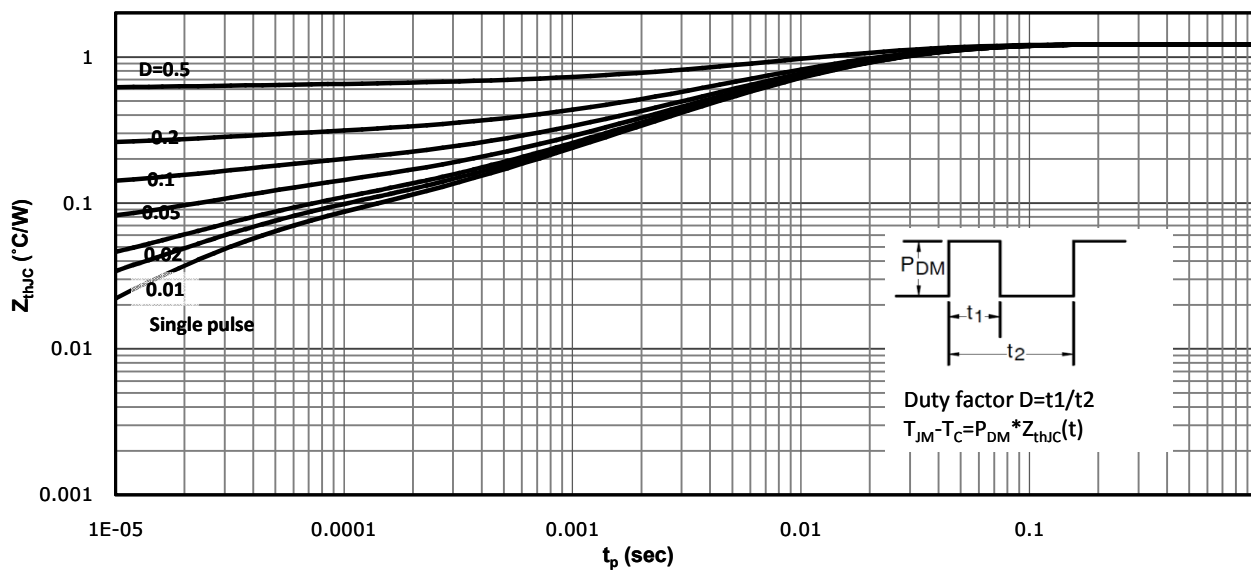


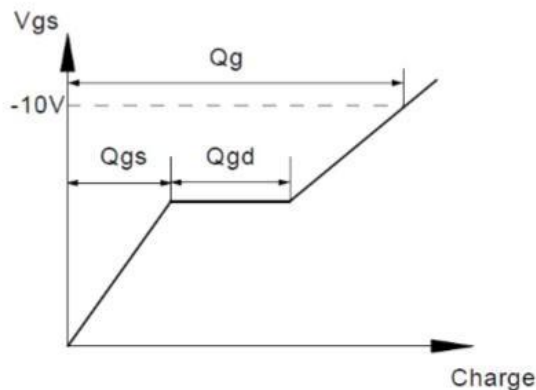
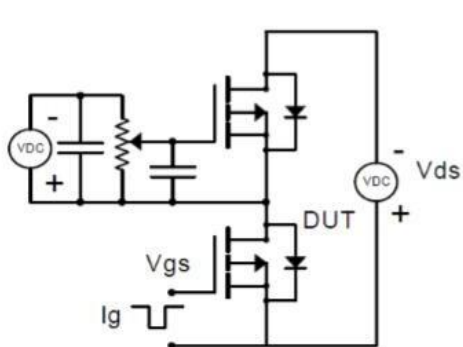


Fig 12: Max. Transient Thermal Impedance

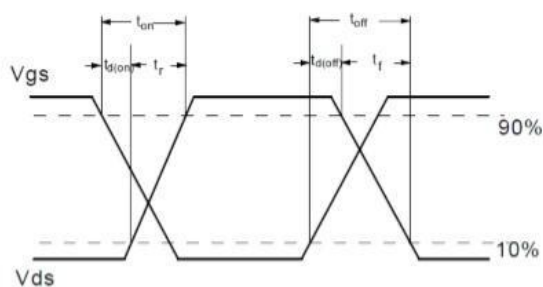
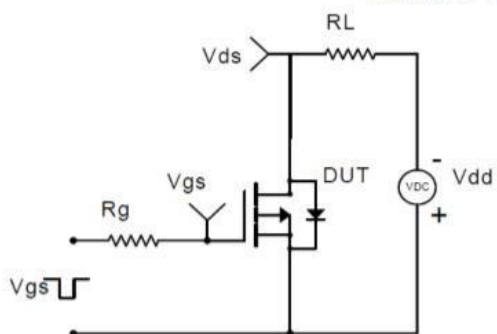


Test Circuit & Waveform

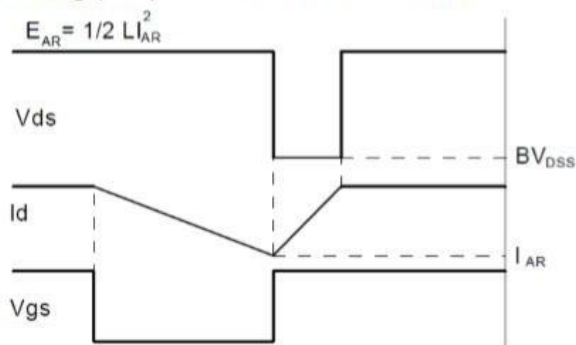
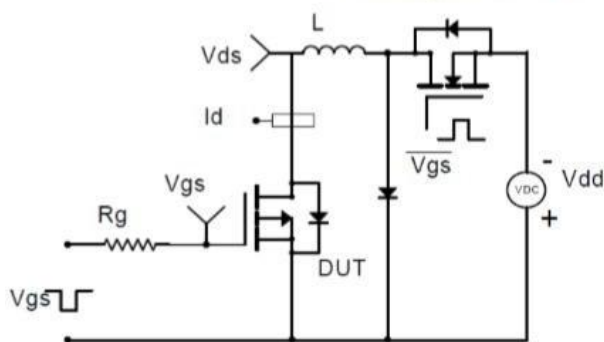
Gate Charge Test Circuit & Waveform



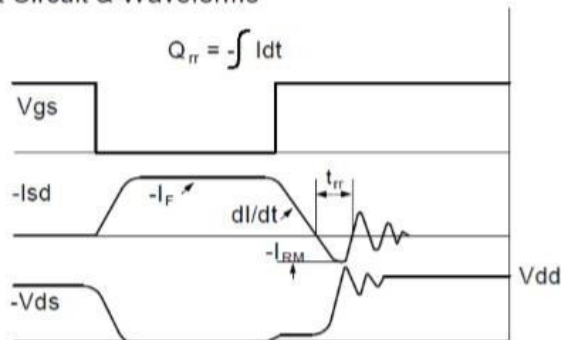
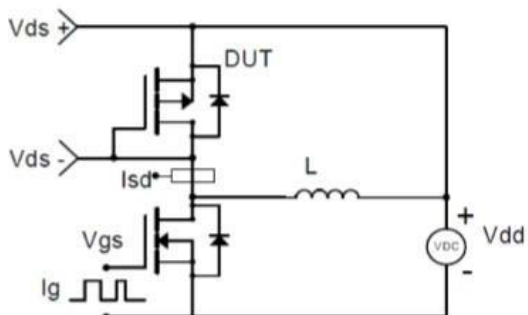
Resistive Switching Test Circuit & Waveforms



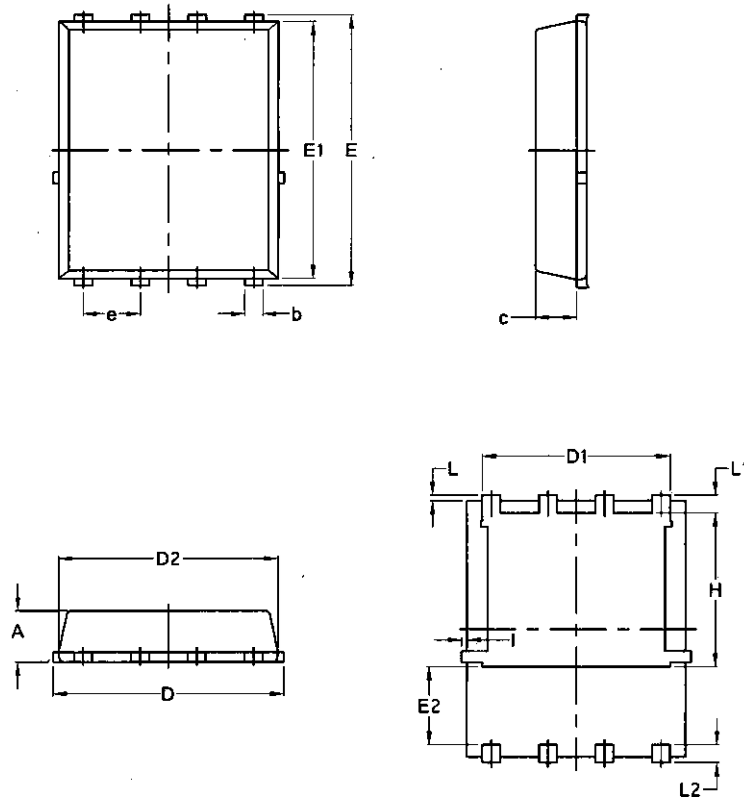
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Mechanical Data-PDFN5060-8L-Single



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070