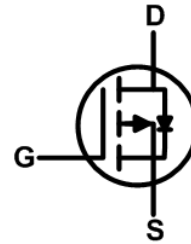




- ★ Super Low Gate Charge
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

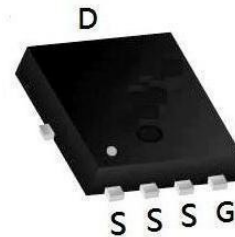


Description

The WLQ20P10F is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The WLQ20P10F meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

PDFN5060-8L Pin Configuration



Product Summary

BVDSS	RDSON	ID
-100V	70mΩ	-25A

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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-100	-	-	V
Gate-body Leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
Zero Gate Voltage Drain Current	$T_J = 25^\circ\text{C}$	$V_{DS} = -100V, V_{GS} = 0V$	-	-	-1	μA
	$T_J = 100^\circ\text{C}$		-	-	-20	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.5	-2	-2.5	V
Drain-Source On-Resistance ⁴	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -10A$	-	70	88	m Ω
		$V_{GS} = -4.5V, I_D = -6A$	-	77	97	
Forward Transconductance ⁴	g_{fs}	$V_{DS} = -10V, I_D = -10A$	-	28	-	S
Dynamic Characteristics⁵						
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 Characteristics⁵						
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	$t_{d(on)}$	$V_{GS} = -10V, V_{DD} = -50V, R_G = 3\Omega, I_D = -10A$	-	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}	$I_F = -10A, di/dt = 100A/\mu s$	-	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	$T_C = 25^\circ\text{C}$	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 $V_{DD} = -35V, V_{GS} = -10V, L = 0.5mH, I_{AS} = -23A$
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

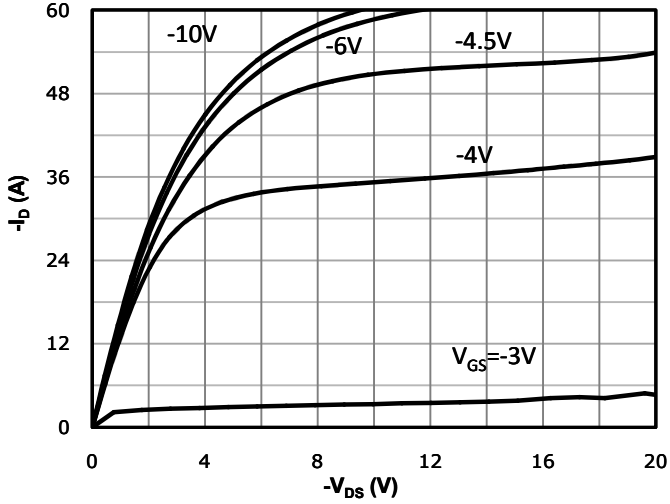


Fig 2: Transfer Characteristics

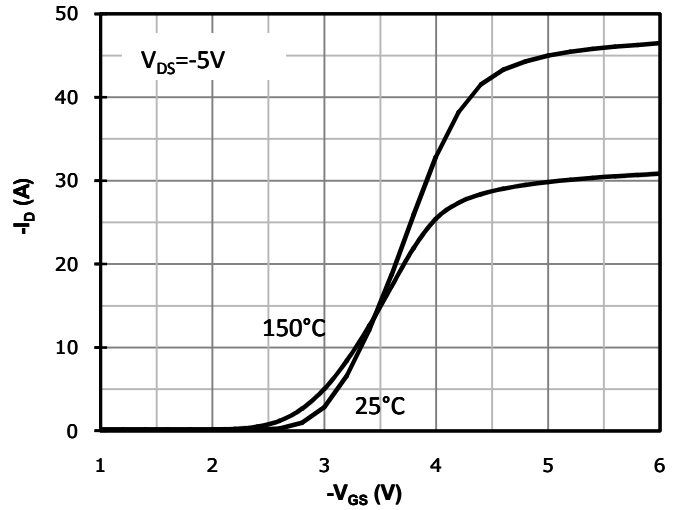


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

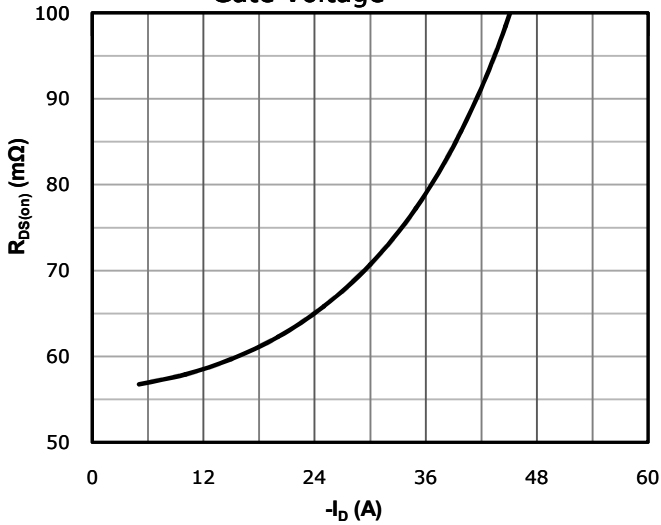


Fig 4: $R_{DS(on)}$ vs Gate Voltage

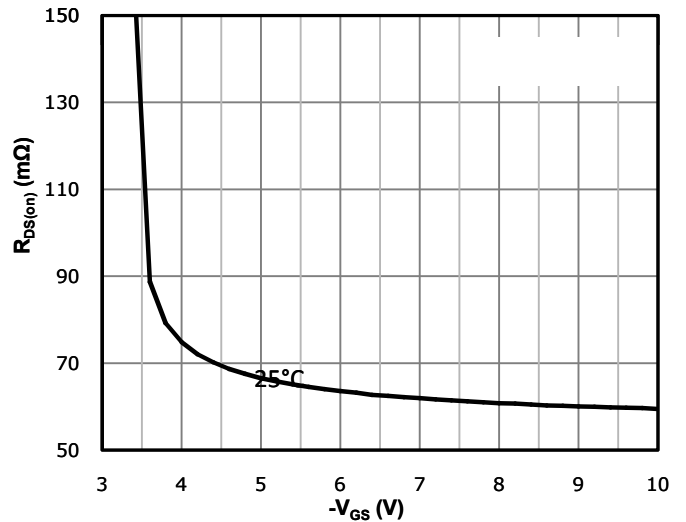


Fig 5: $R_{DS(on)}$ vs. Temperature

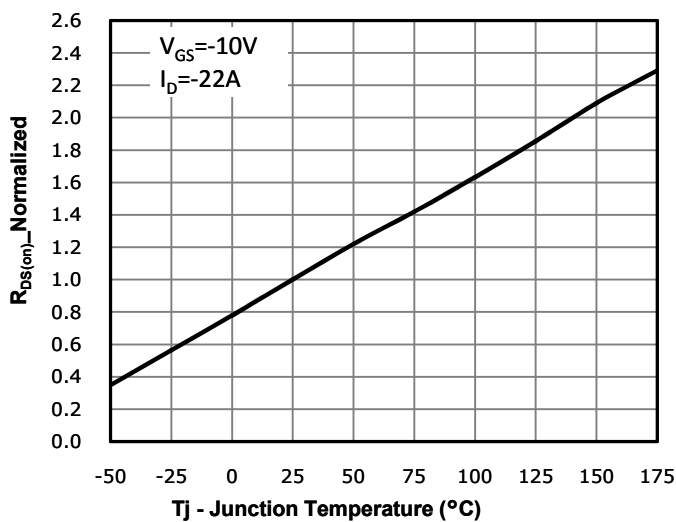


Fig 6: Capacitance Characteristics

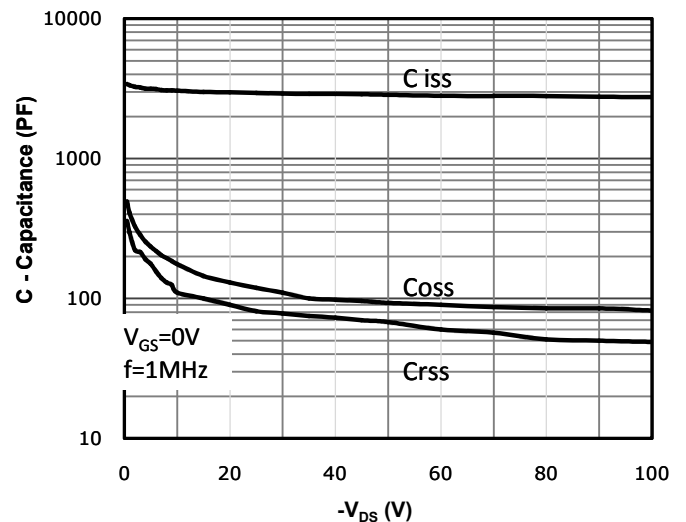




Fig 7: Gate Charge Characteristics

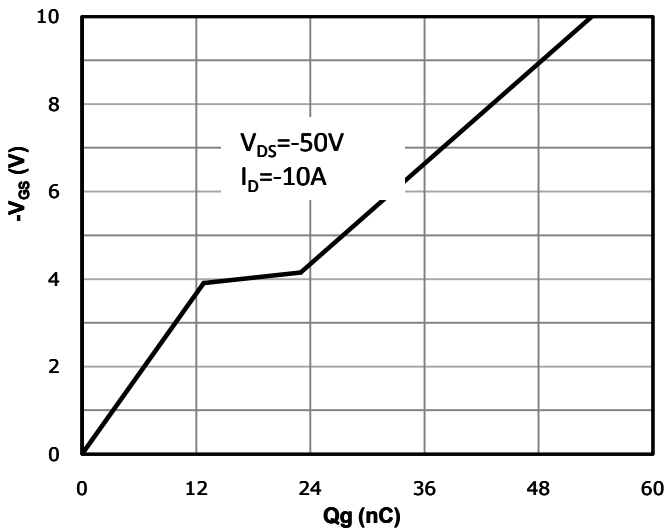


Fig 8: Body-diode Forward Characteristics

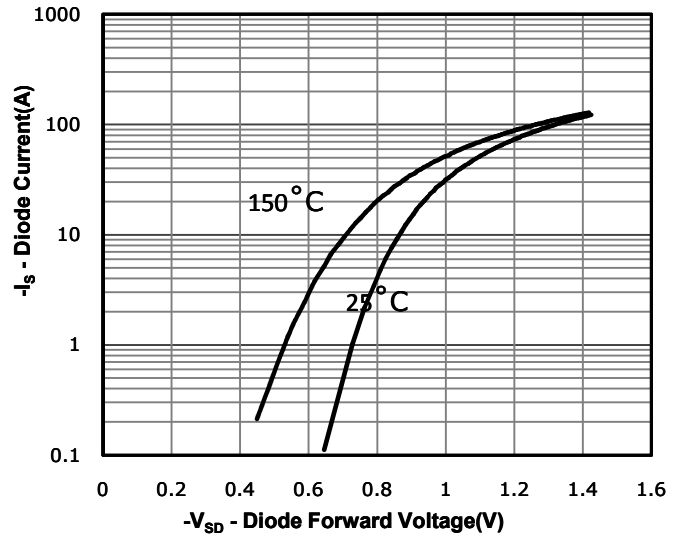


Fig 9: Power Dissipation

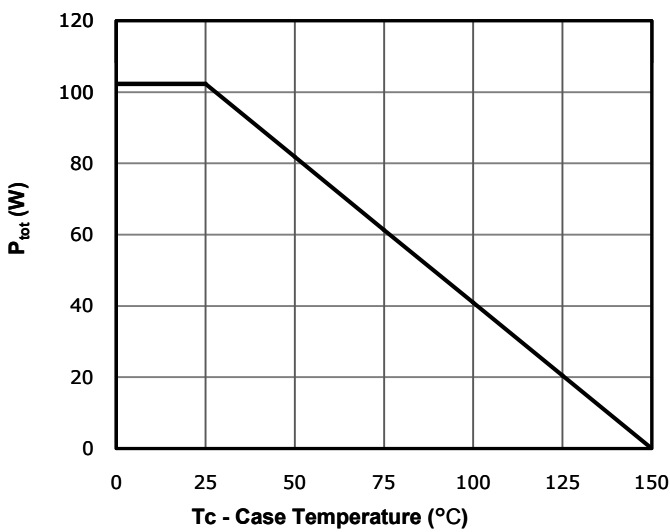


Fig 10: Drain Current Derating

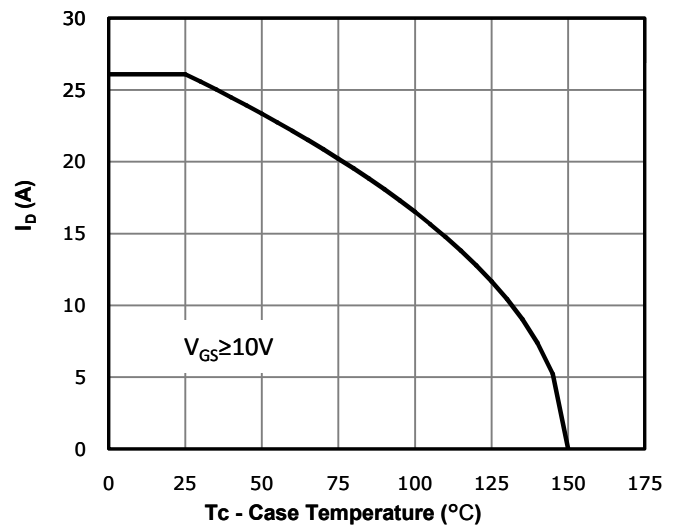


Fig 11: Safe Operating Area

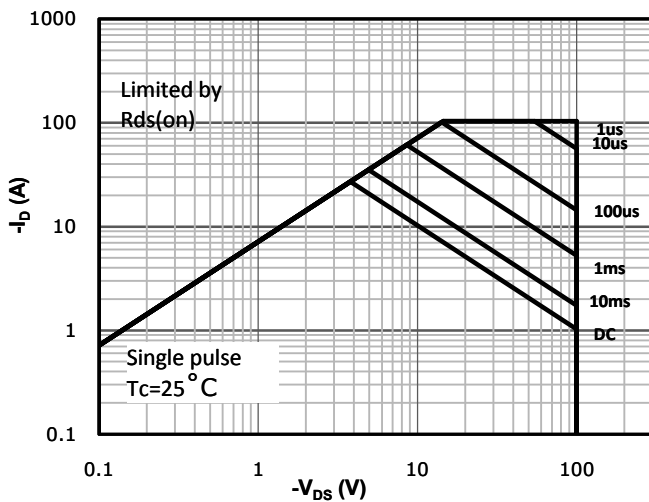
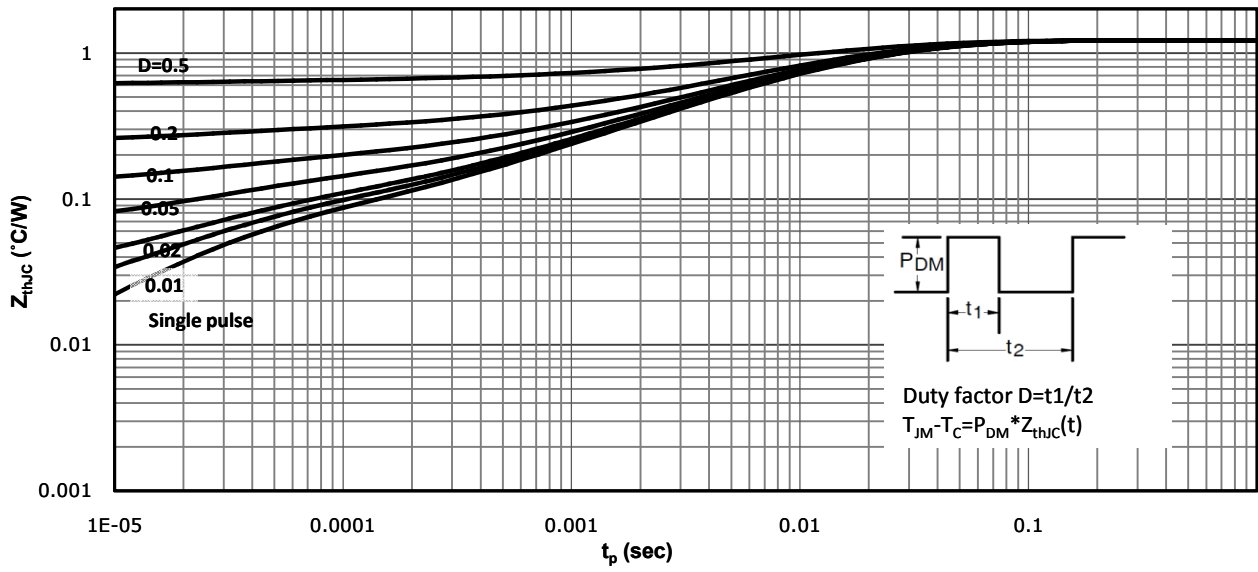




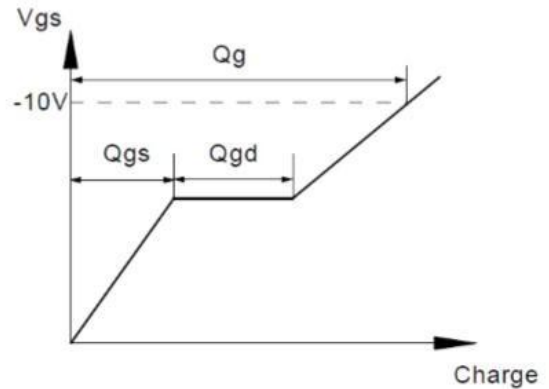
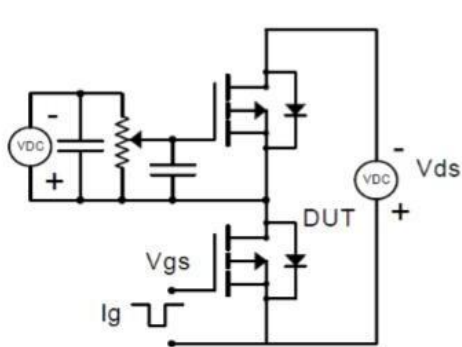
Fig 12: Max. Transient Thermal Impedance



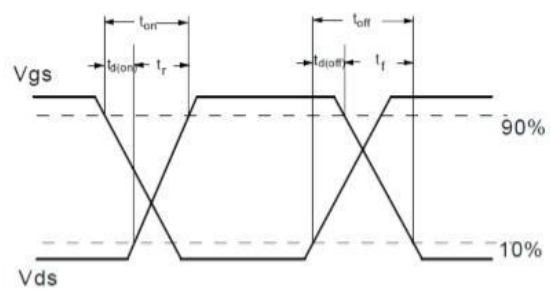
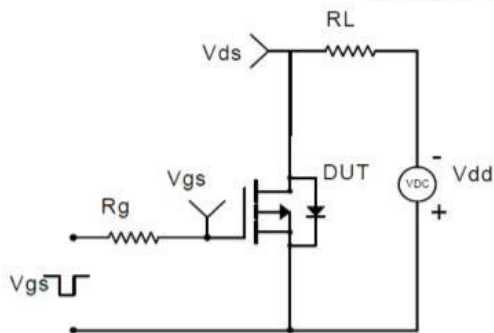


Test Circuit & Waveform

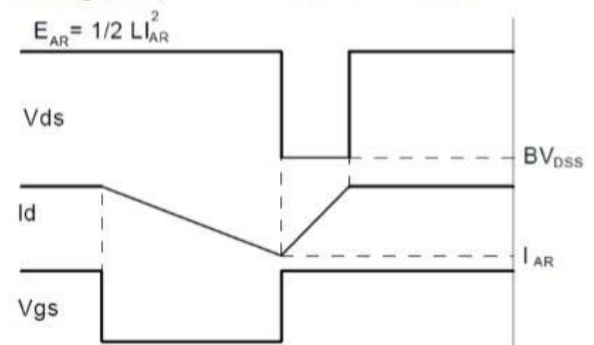
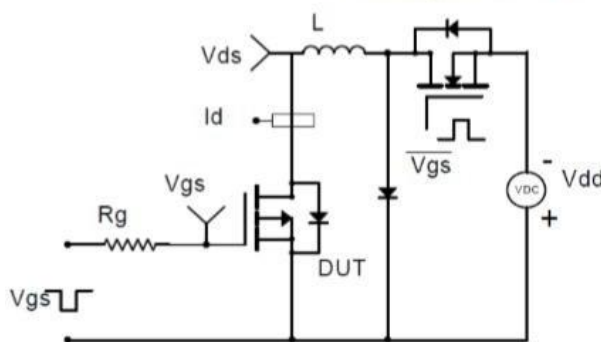
Gate Charge Test Circuit & Waveform



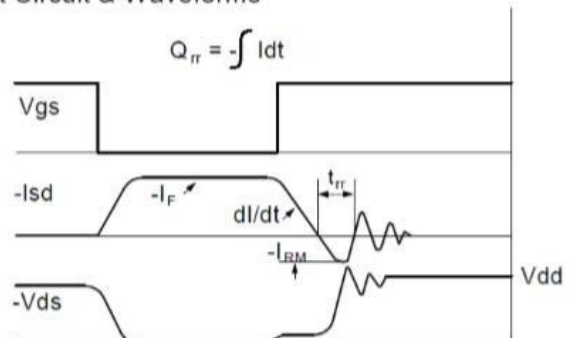
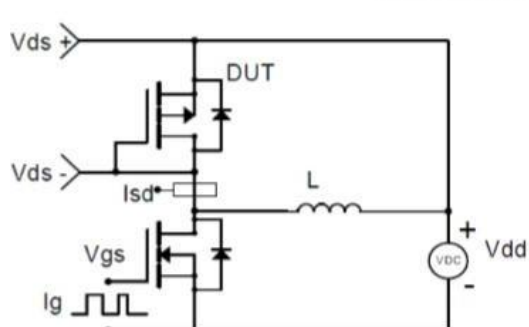
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

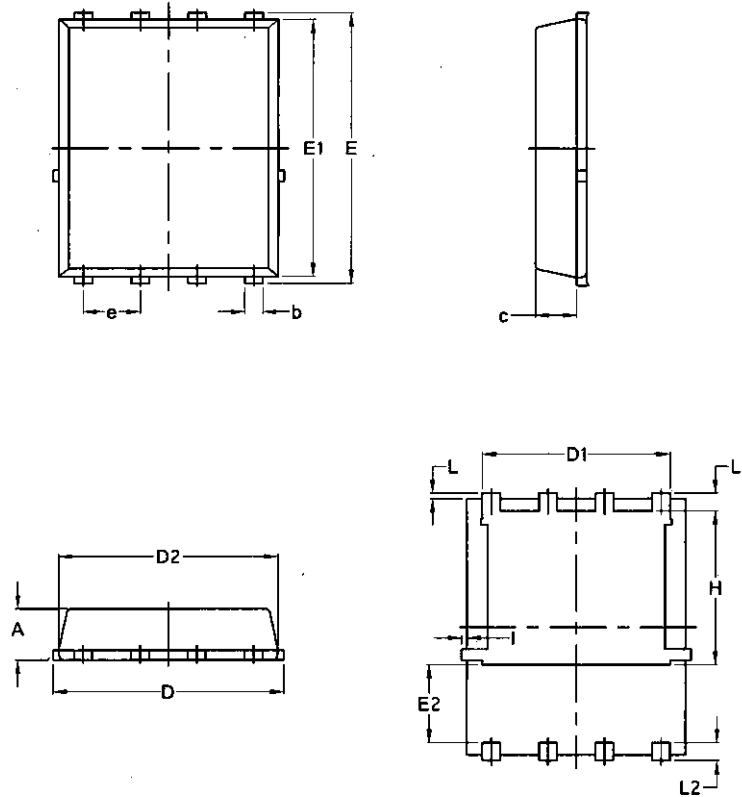


Diode Recovery Test Circuit & Waveforms





Package Mechanical Data-PDFN5060-8L-Single



Symbol	Common			
	mm		Inch	
	Mim	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



Disclaimer

Brunei has made reasonable commercial efforts to ensure that the information given in this datasheet is correct. However, it must clearly be understood that such information is for guidance only and does not constitute any representation or form part of any offer or contract.

For documents and material available from this datasheet, Brunei does not warrant or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, product, technology or process disclosed hereunder.

Brunei reserves the rights to at its own discretion to make any changes or improvements to this datasheet. Unless said datasheet is incorporated into the formal contract, any customer should not rely on the information as any specification or product parameters duly committed by Brunei. Customers are hereby advised to verify that the information contained herein is current and complete before the entering of any contract or acknowledgement of any purchase order. Accordingly, all products specified hereunder shall be sold subject to Brunei's terms and conditions supplied at the time of order acknowledgement. Except where agreed upon by contractual agreement, testing of all parameters of each product is not necessarily performed.

Brunei does not warrant or convey any license either expressed or implied under its patent rights, nor the rights of others. Reproduction of information contained herein shall be only permissible if such reproduction is without any modification or alteration. Reproduction of this information with any alteration is an unfair and deceptive business practice. Brunei is not responsible or liable for such altered documentation.

Resale of Brunei's products with statements different from or beyond the parameters stated by Brunei for that product or service voids all express or implied warranties for the associated Brunei's product or service and is unfair and deceptive business practice. Brunei is not responsible or liable for any such statements.

Brunei's products are not authorized for use as critical components in life support devices or systems without the express written approval of Brunei. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.