

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

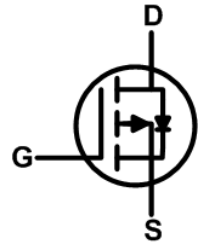
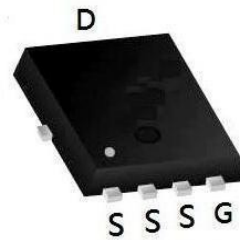

Product Summary

BVDSS	RDSON	ID
-100V	70mΩ	-25A

Description

The XXW20P10F 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 XXW20P10F 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	-25	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	$T_J = 25^\circ\text{C}$	I_{DSS}	$V_{DS} = -100V, V_{GS} = 0V$	-	-	-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 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..

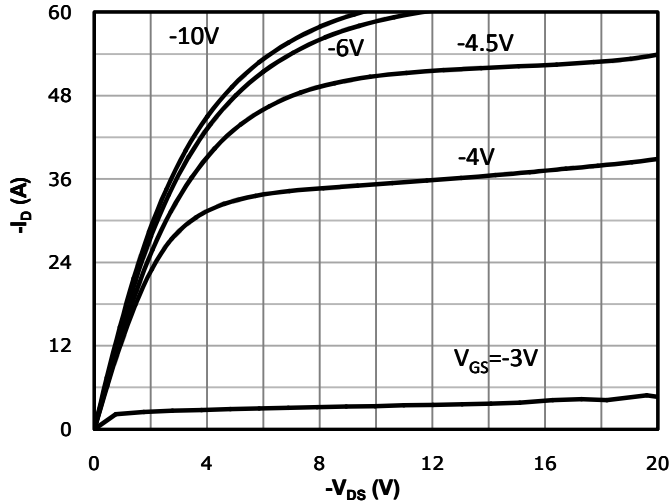
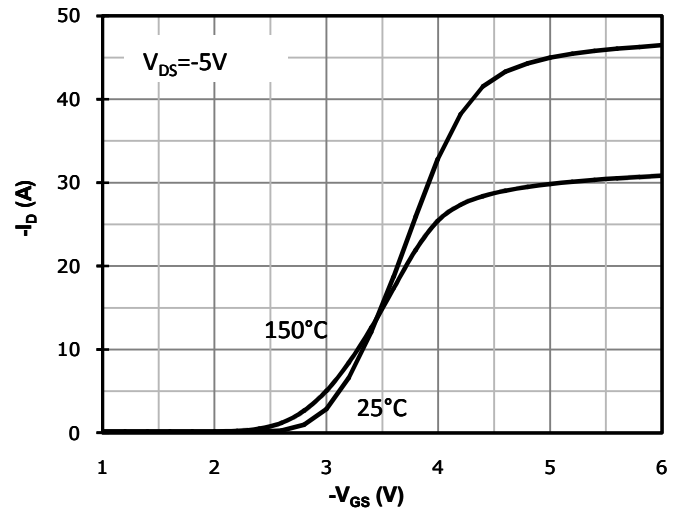
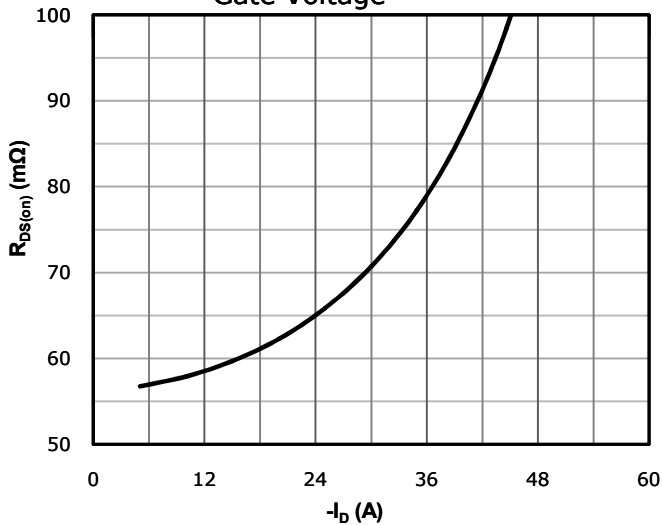
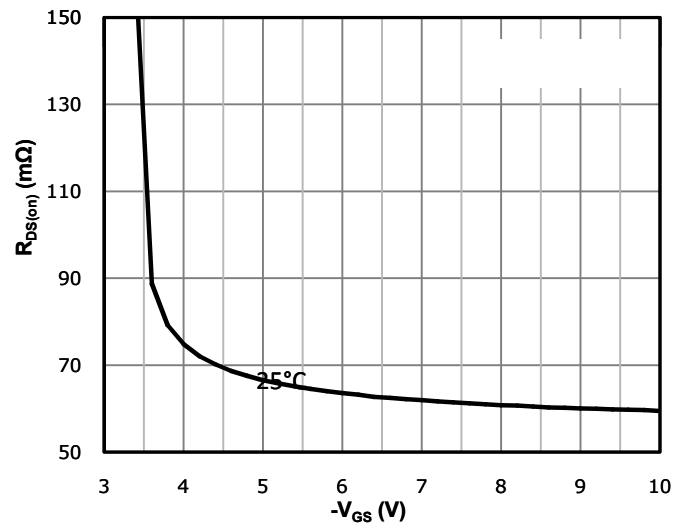
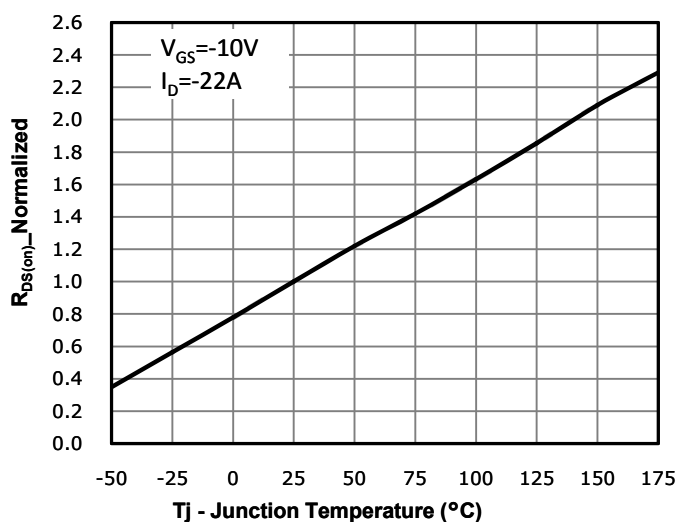
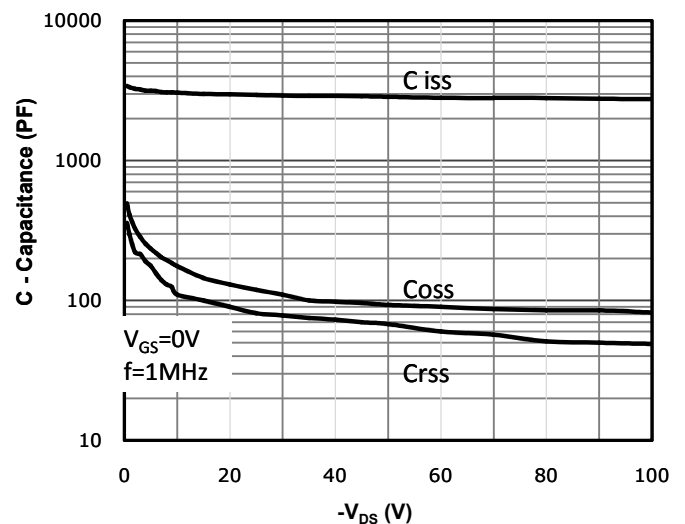
Typical Performance Characteristics
Fig 1: Output Characteristics

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

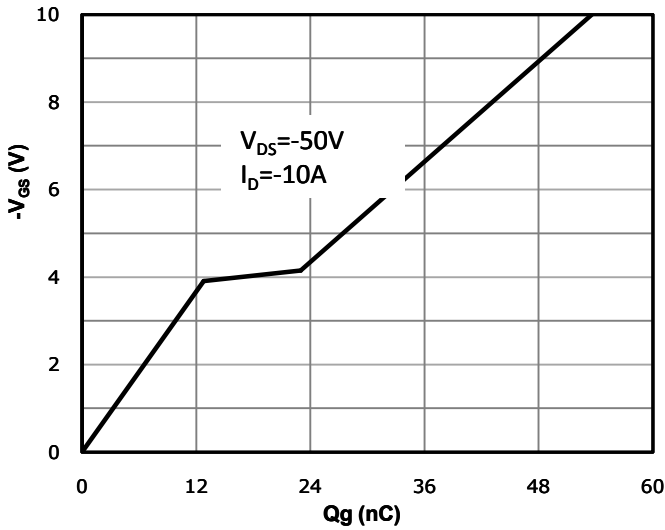


Fig 8: Body-diode Forward Characteristics

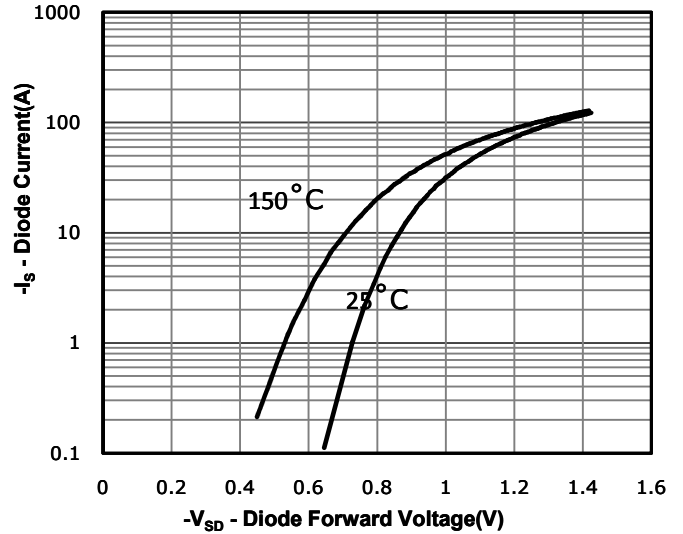


Fig 9: Power Dissipation

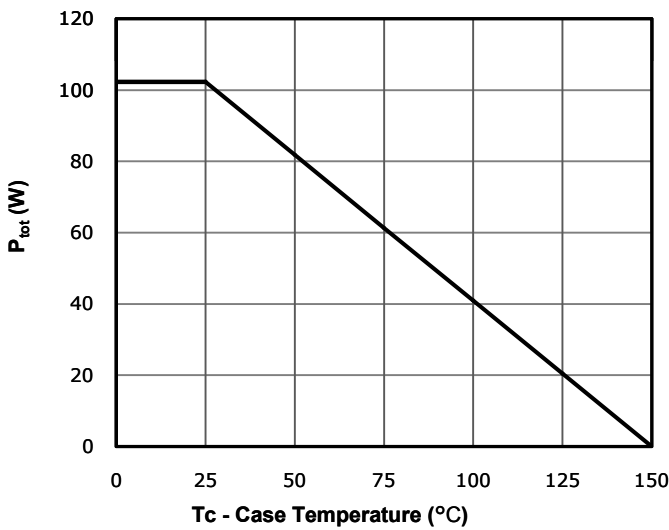


Fig 10: Drain Current Derating

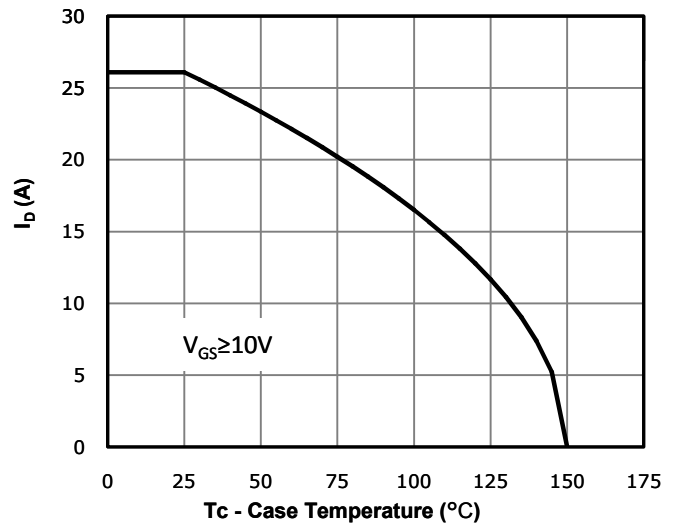


Fig 11: Safe Operating Area

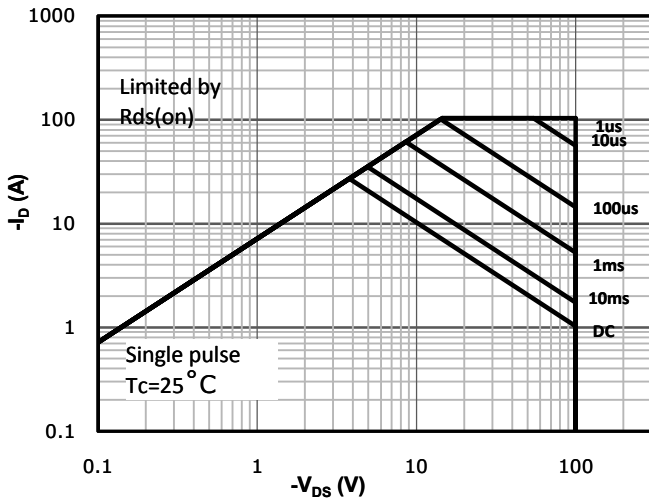
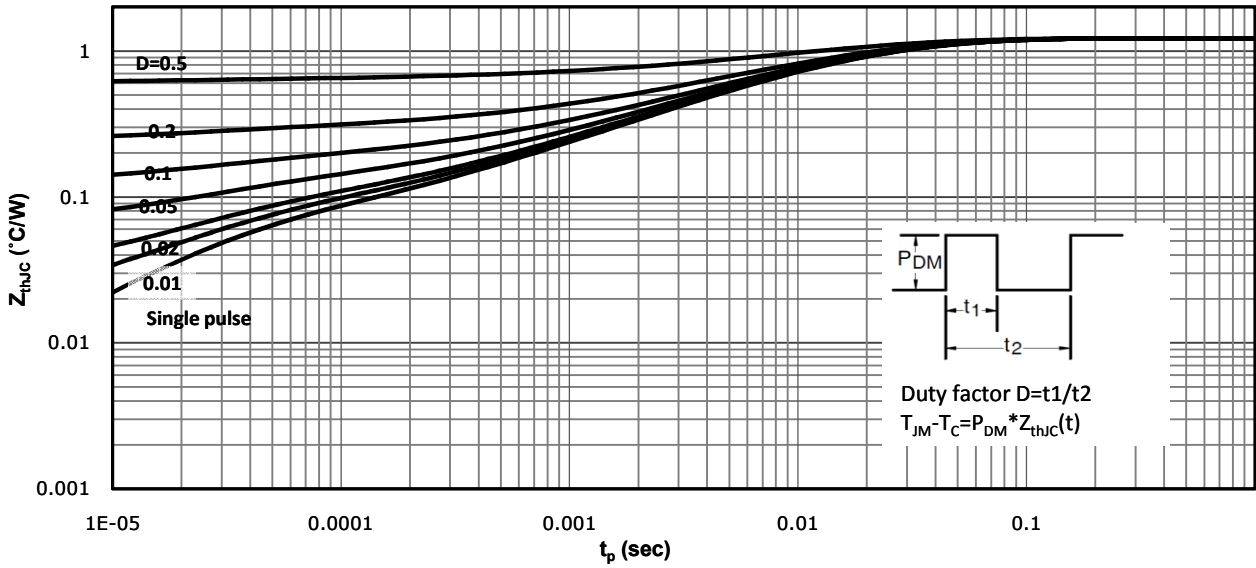
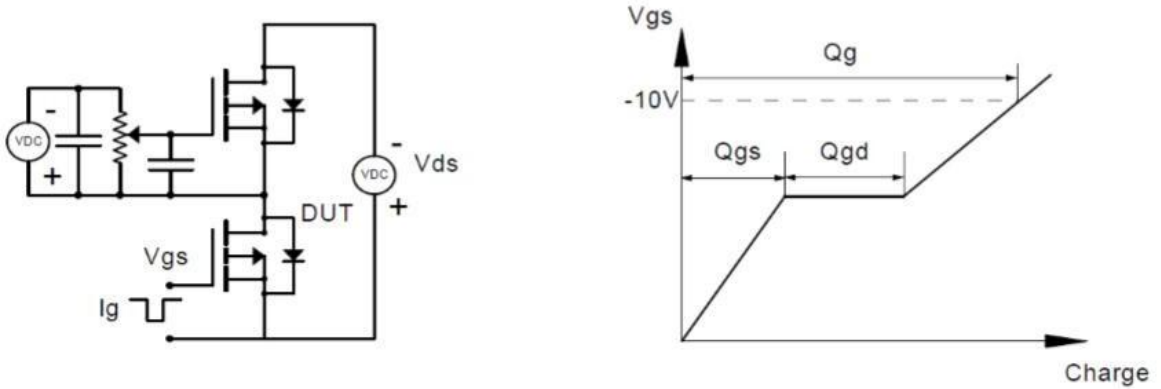
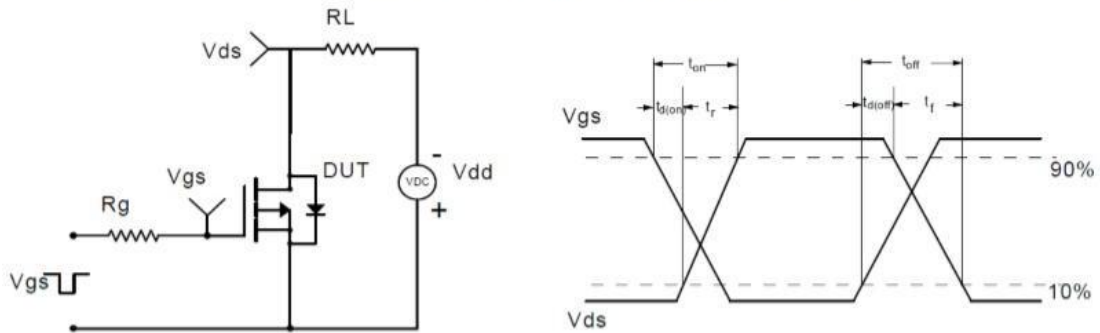
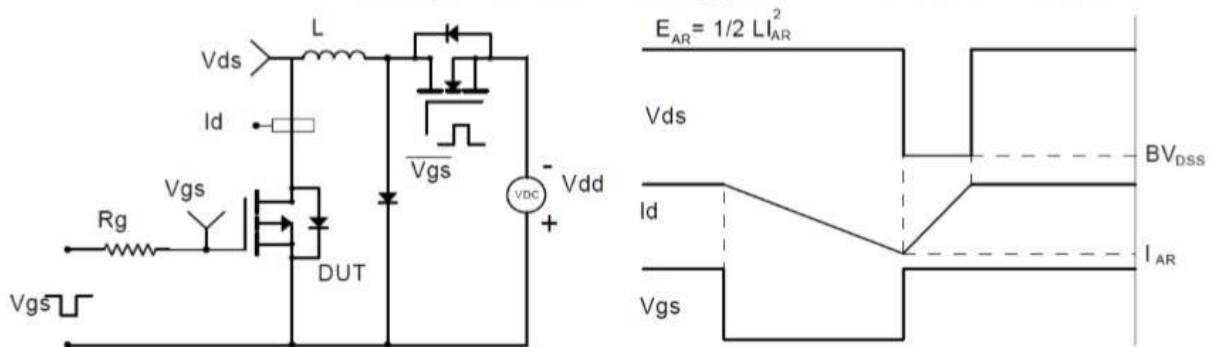
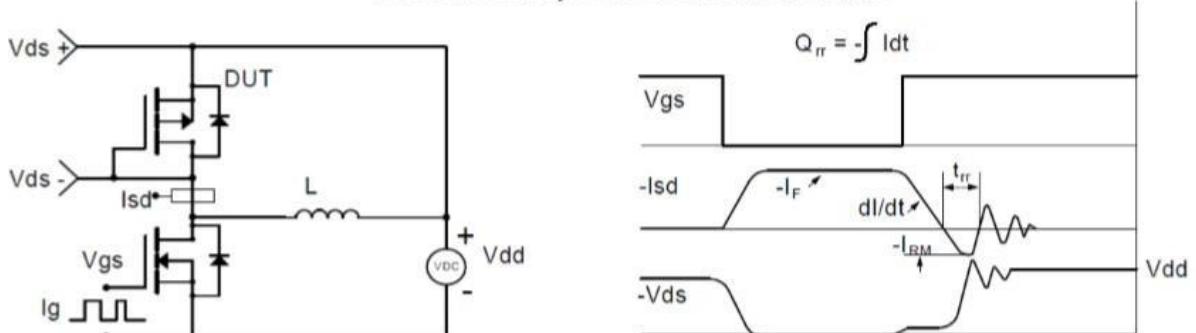
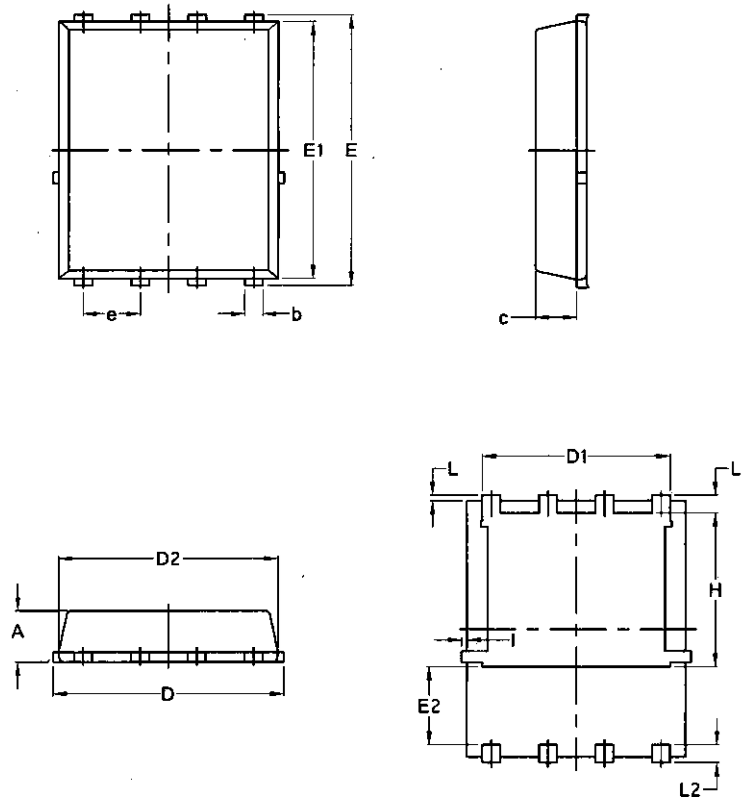


Fig 12: Max. Transient Thermal Impedance



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