

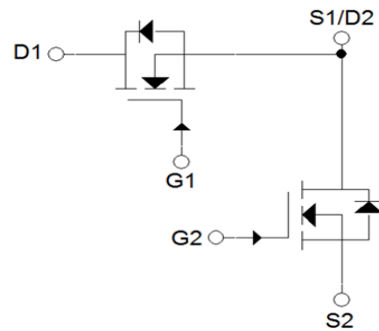


Features

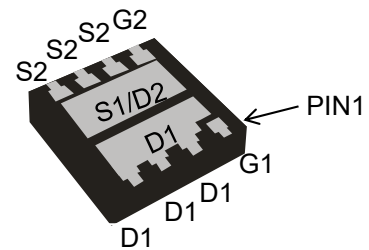
- ★ Split Gate Trench MOS Technology
- ★ 100% EAS Guaranteed
- ★ Fast Switching Speed
- ★ Green Device Available

Applications

- ★ High Frequency Switching and Synchronous Rectification.
- ★ DC/DC Converter.



PDFN5060-8L Pin Configuration



Product Summary

BVDSS	RDSON	ID
30V	6mΩ	50A

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	$T_C=25^{\circ}C$	50
		$T_C=100^{\circ}C$	41
Pulsed Drain Current ¹	I_{DM}	260	A
Single Pulse Avalanche Energy ²	EAS	20	mJ
Total Power Dissipation	P_D	31.25	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	$R_{\theta JA}$	60	°C/W
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	4	°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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30	-	-	V	
Gate-body Leakage Current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$	$T_J=25^\circ\text{C}$	-	-	1	μA
			$T_J=100^\circ\text{C}$	-	-	100	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.6	2.4	V	
Drain-Source On-Resistance ⁴	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	-	6	8	m Ω	
		$V_{GS} = 4.5V, I_D = 10A$	-	7.5	9.8		
Forward Transconductance ⁴	g_{fs}	$V_{DS} = 10V, I_D = 20A$	-	130	-	S	
Dynamic Characteristics⁵							
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1MHz$	-	905	-	pF	
Output Capacitance	C_{oss}		-	475	-		
Reverse Transfer Capacitance	C_{rss}		-	57	-		
Gate Resistance	R_g	$f = 1MHz$	-	1.9	-	Ω	
Switching Characteristics⁵							
Total Gate Charge	Q_g	$V_{GS} = 10V, V_{DS} = 15V, I_D = 20A$	-	16	-	nC	
Gate-Source Charge	Q_{gs}		-	3	-		
Gate-Drain Charge	Q_{gd}		-	3.3	-		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 15V, R_G = 3\Omega, I_D = 20A$	-	6.3	-	ns	
Rise Time	t_r		-	3.2	-		
Turn-Off Delay Time	$t_{d(off)}$		-	18	-		
Fall Time	t_f		-	3.6	-		
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 20A, di/dt = 100A/\mu s$	-	10	-	ns	
Body Diode Reverse Recovery Charge	Q_{rr}		-	13.2	-	nC	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴	V_{SD}	$I_S = 20A, V_{GS} = 0V$	-	-	1.2	V	
Continuous Source Current	I_S	$T_C = 25^\circ\text{C}$	-	-	50	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 $V_{DD} = 25V, V_{GS} = 10V, L = 0.1mH, I_{AS} = 20A$.
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 Characteristics

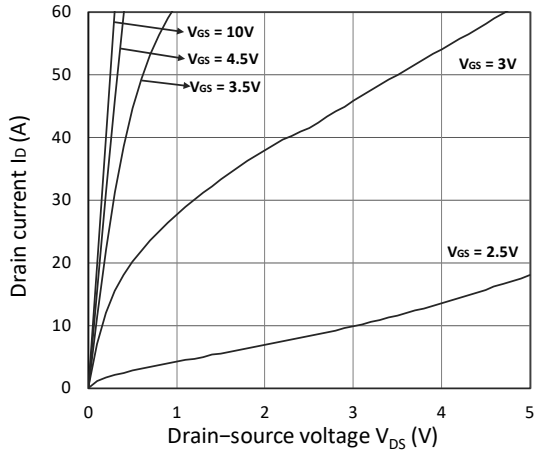


Figure 1. Output Characteristics

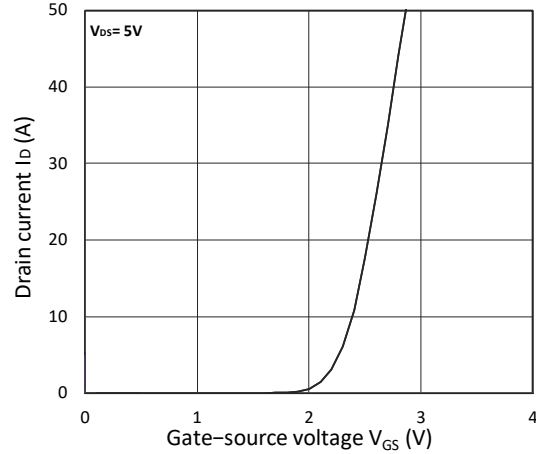


Figure 2. Transfer Characteristics

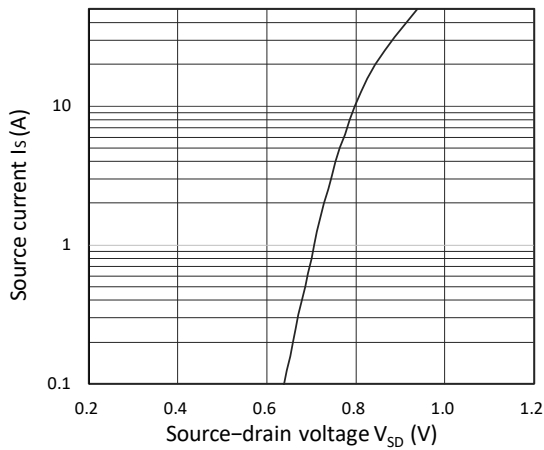


Figure 3. Forward Characteristics of Reverse

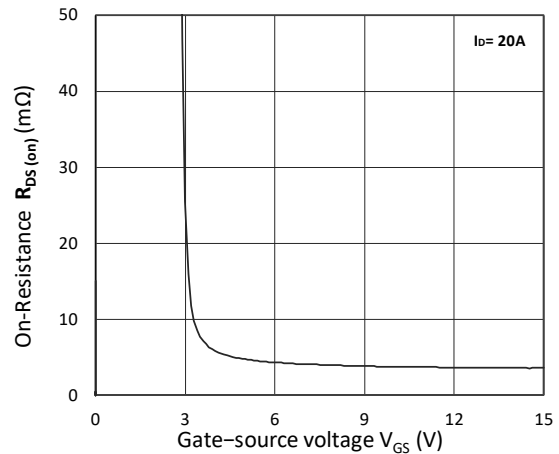


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

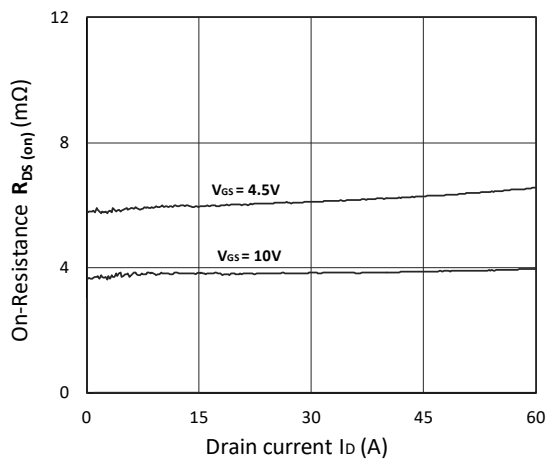


Figure 5. $R_{DS(ON)}$ vs. I_D

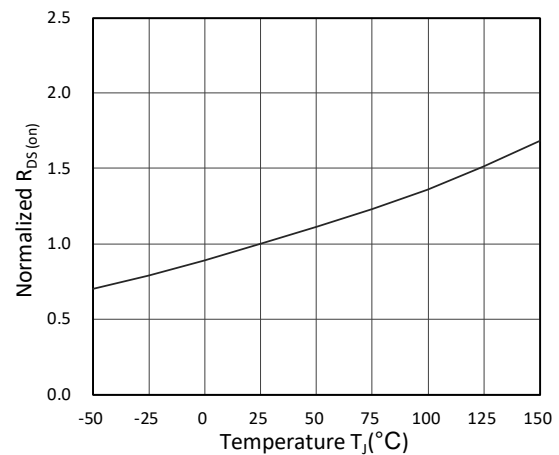


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

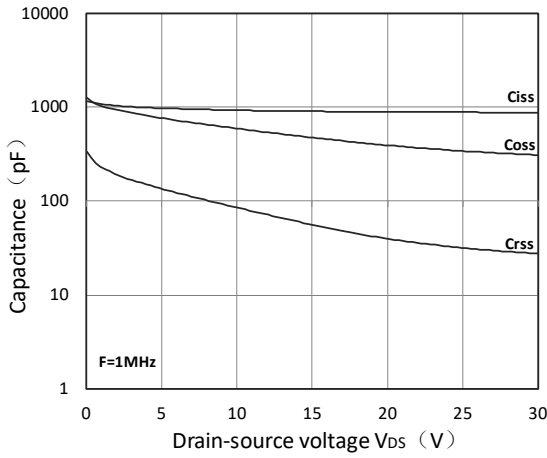


Figure 7. Capacitance Characteristics

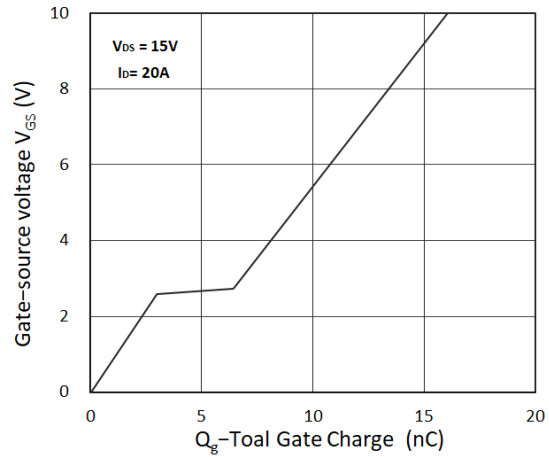


Figure 8. Gate Charge Characteristics

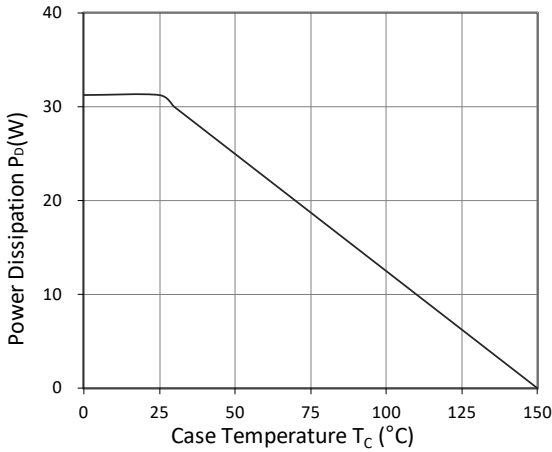


Figure 9. Power Dissipation

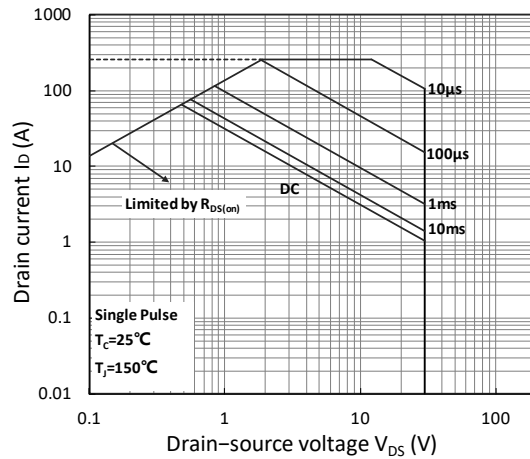


Figure 10. Safe Operating Area

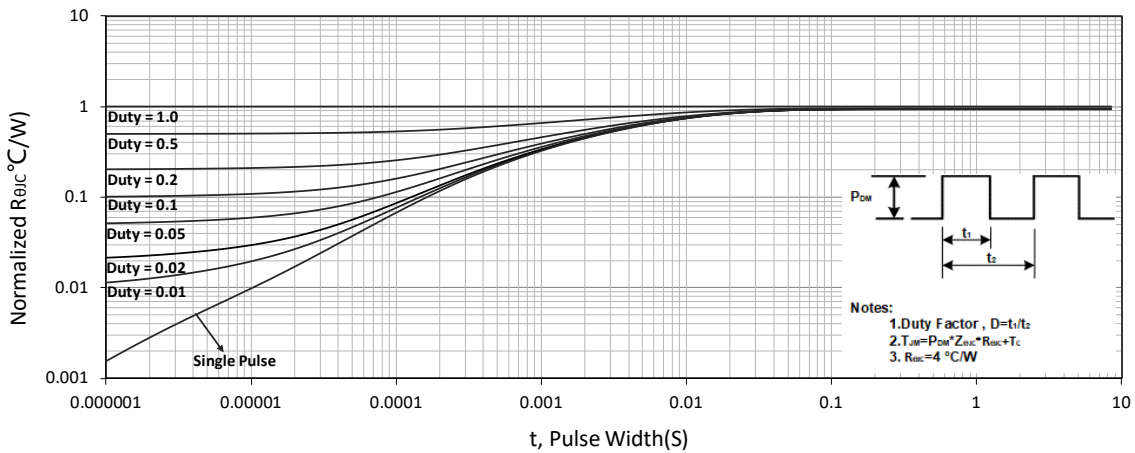
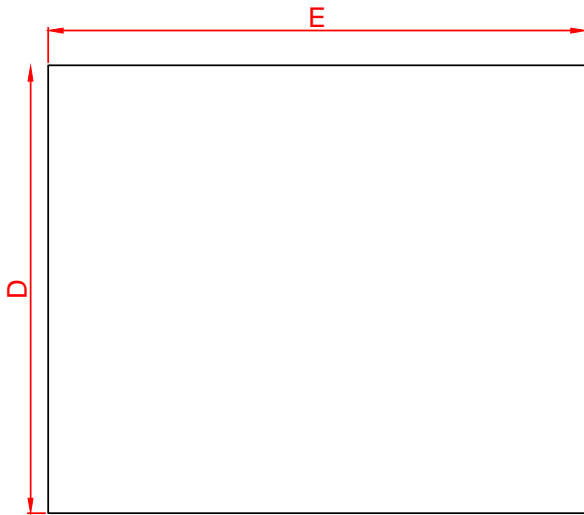


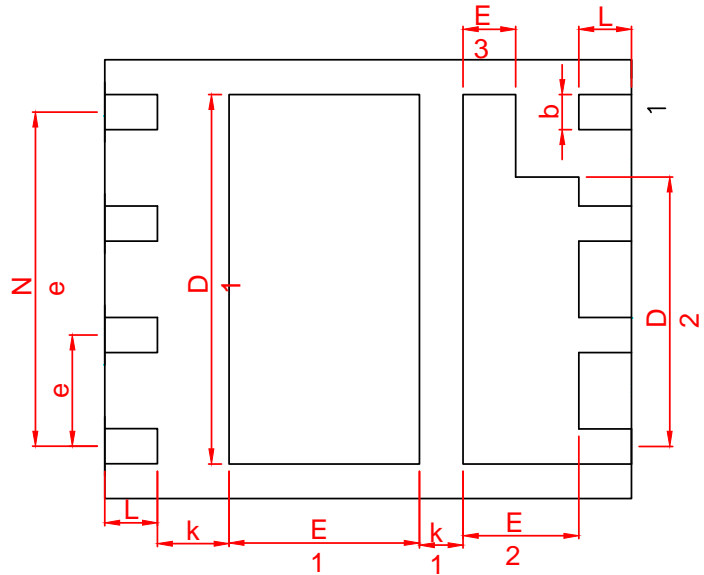
Figure 11. Normalized Maximum Transient Thermal Impedance



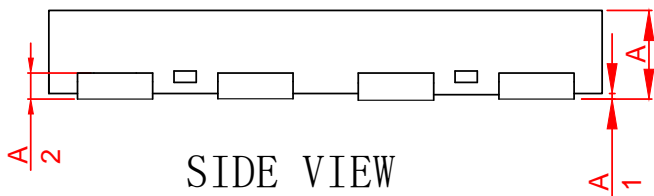
PDFN5060-8L Package Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
* A1	0.00	0.02	0.05
* b	0.36	0.41	0.46
* A2	0.203 BSC		
* D	4.90	5.00	5.10
* D1	4.15	4.20	4.25
* D2	2.87	3.07	3.27
* E	5.90	6.00	6.10
* E1	2.02	2.17	2.32
E2	1.22	1.32	1.42
E3	0.55	0.60	0.65
* e	1.27 REF		
* Ne	BSC 3.81		
k	0.71	0.81	0.91
* k1	0.40	0.50	0.60
* L	0.55	0.60	0.65



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