



Features

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

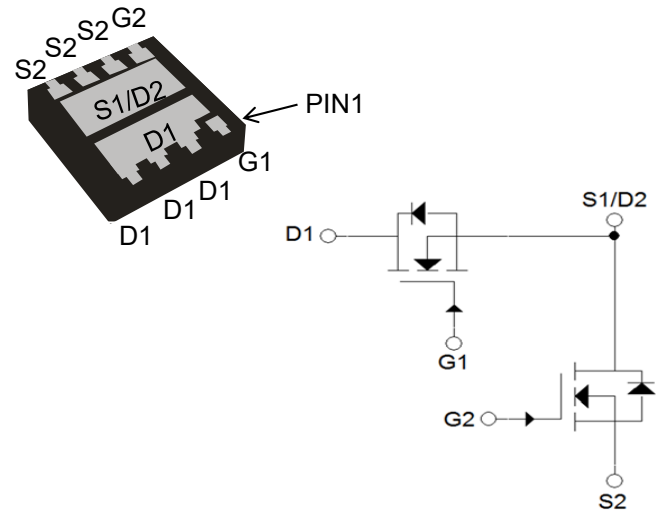
Applications

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

Product Summary

BVDSS	RDSON	ID
30V	6mΩ	50A

DFN5060-8L Pin Configuration



Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_C=25^{\circ}\text{C}$	I_D	50	A
	$T_C=100^{\circ}\text{C}$		41	
Pulsed Drain Current ¹		I_{DM}	260	A
Single Pulse Avalanche Energy ²		EAS	20	mJ
Total Power Dissipation	$T_C=25^{\circ}\text{C}$	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 = 250μA	30	-	-	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} = 30V, V _{GS} = 0V	-	-	1	μA
	T _J =100°C			-	-	100	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.2	1.6	2.4	V
Drain-Source On-Resistance ⁴		R _{DS(on)}	V _{GS} = 10V, I _D = 20A	-	6	8	mΩ
			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 Characteristics ⁵							
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 Characteristics ⁵							
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 = 3Ω, 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/μs	-	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	T _C =25°C	I _S	-	-	-	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 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 Characteristics

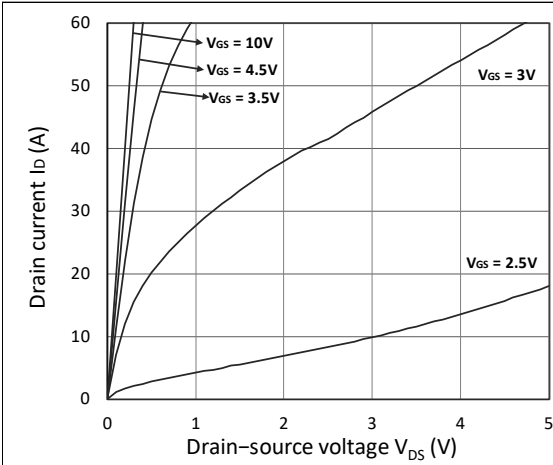


Figure 1. Output Characteristics

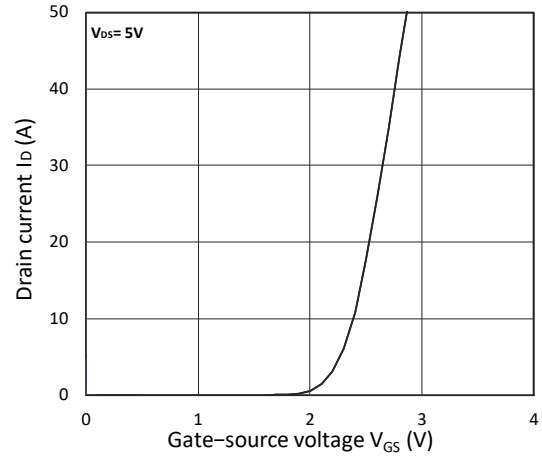


Figure 2. Transfer Characteristics

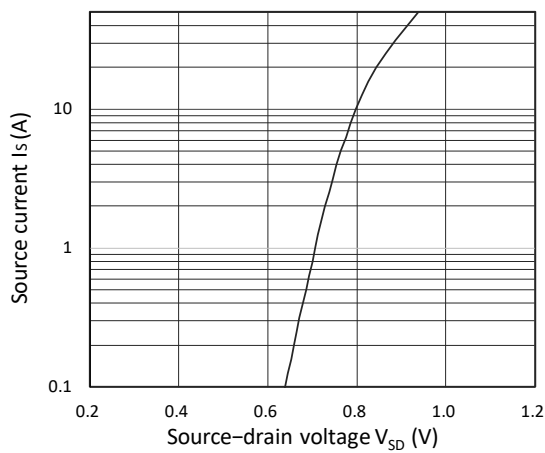


Figure 3. Forward Characteristics of Reverse

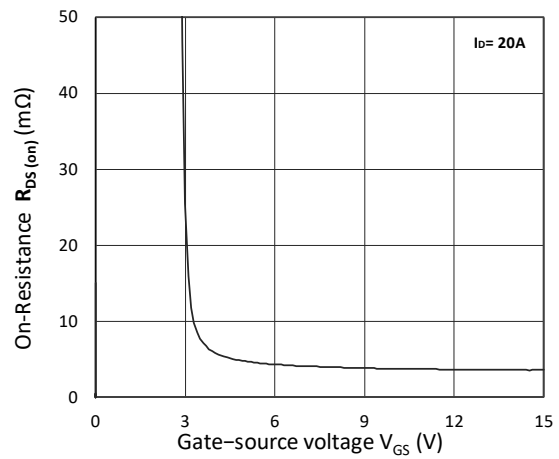


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

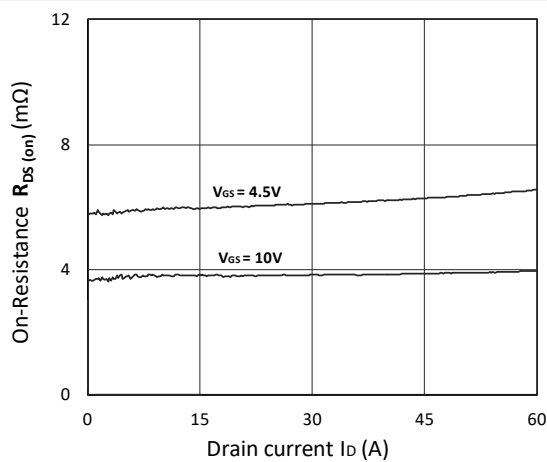


Figure 5. $R_{DS(ON)}$ vs. I_D

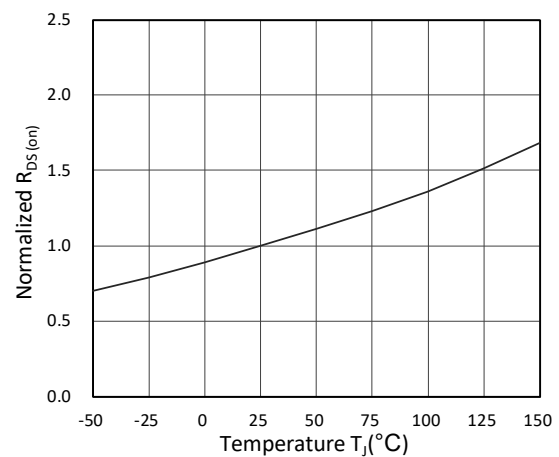


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

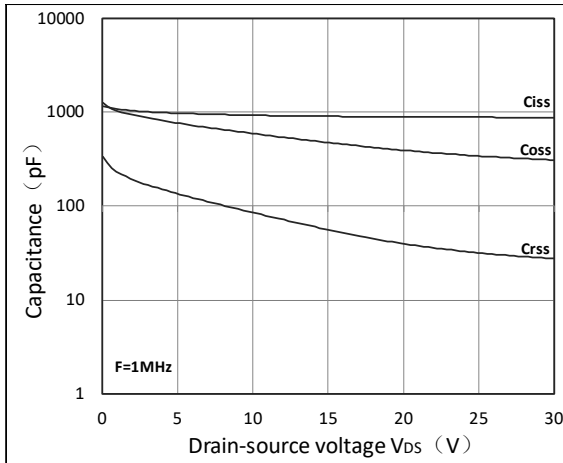


Figure 7. Capacitance Characteristics

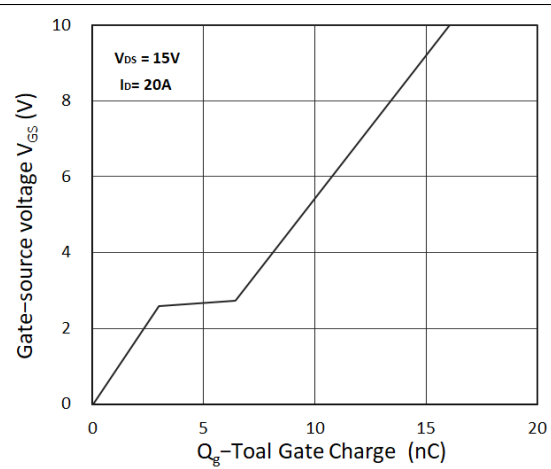


Figure 8. Gate Charge Characteristics

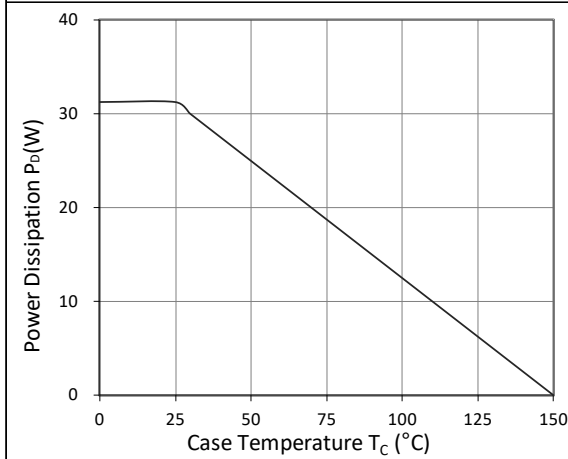


Figure 9. Power Dissipation

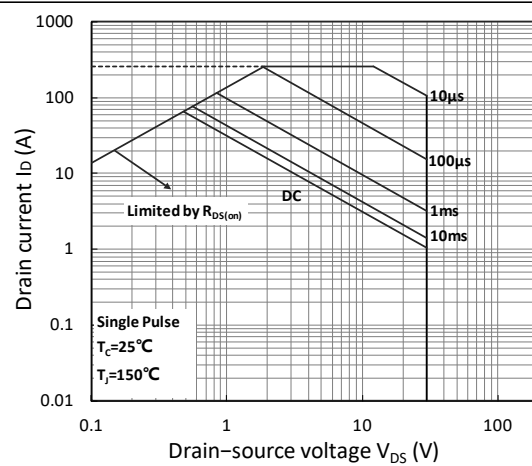


Figure 10. Safe Operating Area

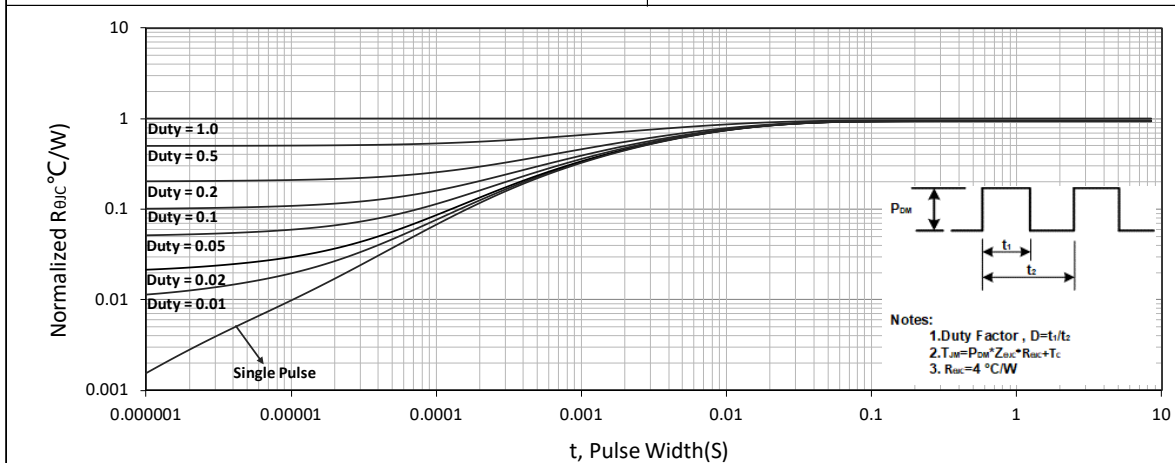
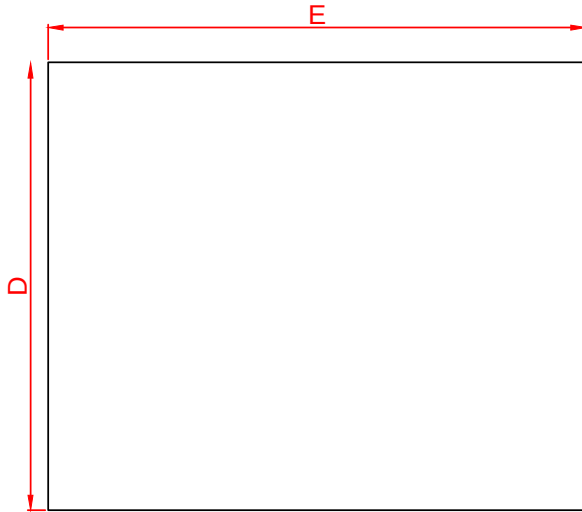
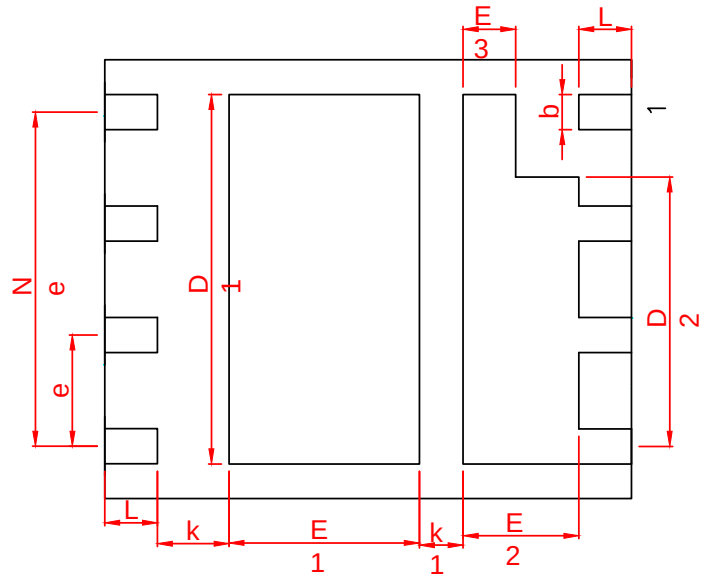


Figure 11. Normalized Maximum Transient Thermal Impedance

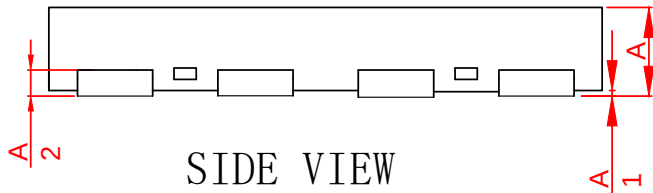
DFN5060-8L Package Information



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