40V N-Channel SGT Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)TYP}$	I_D
40V	4.5mΩ @V_{GS}=10V	60A
	5.5mΩ @V_{GS}=4.5V	

Description

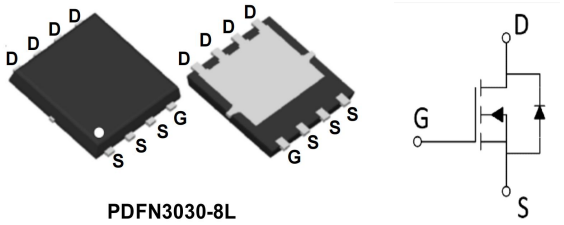
- SGT Power MOSFET Technology
- Low RDSON and Low Gate Charge
- High Current Capability
- High Speed Switching
- 100% UIS tested
- RoHS and Halogen-Free Complaint

Applications:

- DC/DC Converters
- Power Management Switches

Marking Information

Device	Marking	Package	Shipping
LPM04N046GE	LPS M04N046GE YWX	PDFN3030-8L	5K/REEL
Marking indication: Y:Production year W:Production week X: Series Number			



PDFN3030-8L

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25° C	I_D	60	A
	Tc=100° C		38	A
Pulsed Drain Current[note1]		I_{DM}	240	A
Single Pulse Avalanche Energy [note2]		E_{AS}	50	mJ
Total Power Dissipation[4]	Tc=25° C	P_D	35	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 [note3]	$R_{\theta JA}$	60	℃/W
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	3.5	℃/W

Electrical Characteristics (TJ = 25°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=250uA	40	-	-	V
Gate-Body Leakage Current		I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25℃	I_{DSS}	V_{DS}=40V, V_{GS}=0V	-	-	1	μA
	T_J=100℃			-	-	100	μA
Gate Threshold Voltage		$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.0	1.35	2.0	V
Drain-Source on-Resistance note4		$R_{DS(on)}$	V_{GS}=10V, I_D=20A	-	4.5	5.8	mΩ
			V_{GS}=4.5V, I_D=10A	-	5.5	7.4	mΩ
Forward Transconductance note4		gfs	V_{DS}=5V, I_D=20A	-	78	-	S
Dynamic Characteristics note5							
Input Capacitance		C_{iss}	V_{DS}=20V, V_{GS}=0V, f=1MHz	-	1155	-	pF
Output Capacitance		C_{oss}		-	268	-	pF
Reverse Transfer Capacitance		C_{rss}		-	12.3	-	pF
Gate Resistance		R_G	f=1MHz	-	0.9	-	Ω
Switching Characteristics note5							
Total Gate Charge		Q_g	V_{GS} = 10V, V_{DS}=20V, I_D= 20A	-	18	-	nC
Gate-Source Charge		Q_{gs}		-	3.5	-	nC
Gate-Drain Charge		Q_{gd}		-	2.7	-	nC
Turn-on Delay Time		$t_{d(on)}$	V_{GS}=10V, V_{DD}=20V, R_G=3Ω, I_D=20A	-	7.6	-	nS
Rise Time		Tr		-	1.5	-	nS
Turn-off Delay Time		$T_{d(off)}$		-	17.0	-	nS
Fall Time		tf		-	3.0	-	nS
Drain-Source Body Diode Characteristics							
Diode Forward Voltage note4		V_{SD}	I_S=20A, V_{GS}=0V	-	-	1.2	V
Continuous Source Current	Tc=25℃	I_S	-	-	-	60	A
Body Diode Reverse Recovery Time		trr	IF=20A, di/dt=100A/us	-	25	-	nS
Body Diode Reverse Recovery Charge		Qrr		-	6	-	nC

Notes:

1. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150° C.
2. The test condition is VDD=32V,VGS=10V,L=0.5mH
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 ≤ 300us, duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics (Ta=25℃, unless otherwise noted)

Figure 1: Output Characteristics

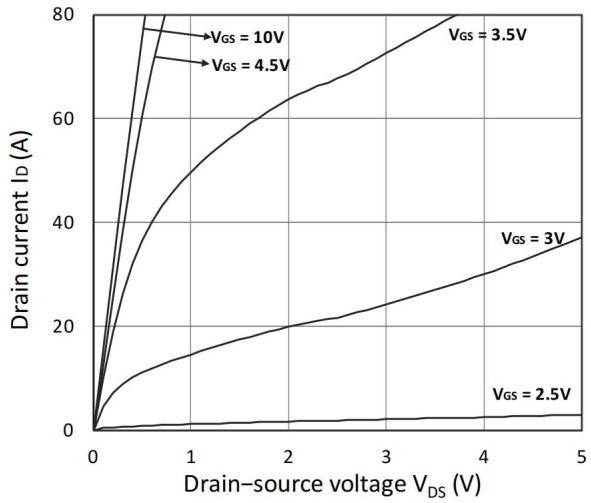


Figure 2: Transfer Characteristics

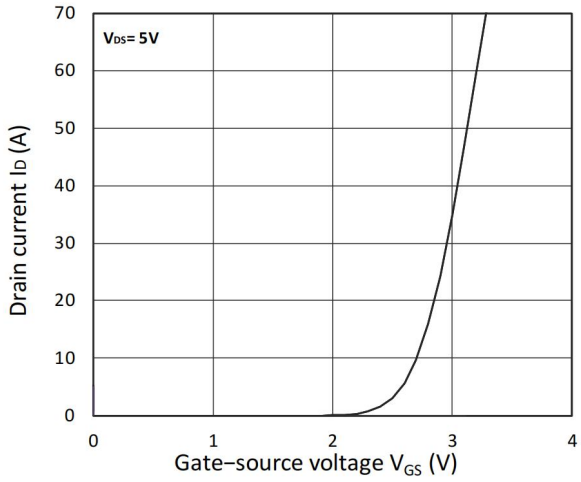


Figure 3: Forward Characteristics of Reverse

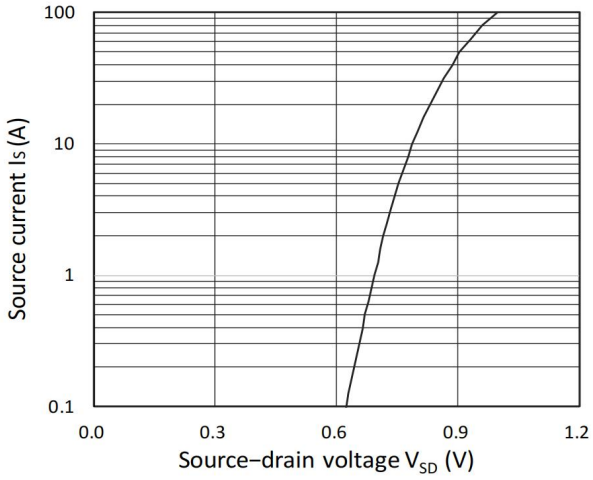


Figure 4: $R_{DS(ON)}$ VS V_{GS}

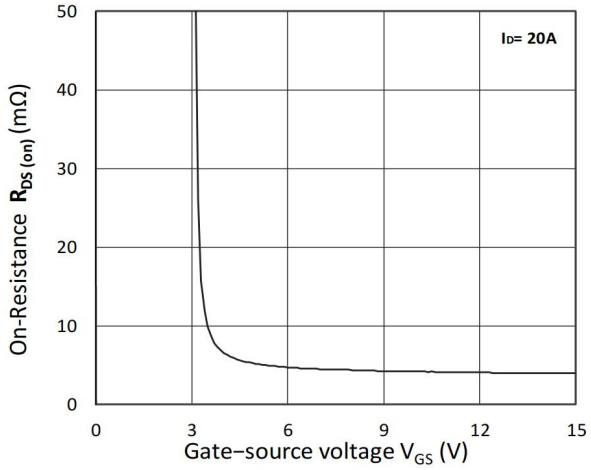


Figure 5: $R_{DS(ON)}$ vs I_D

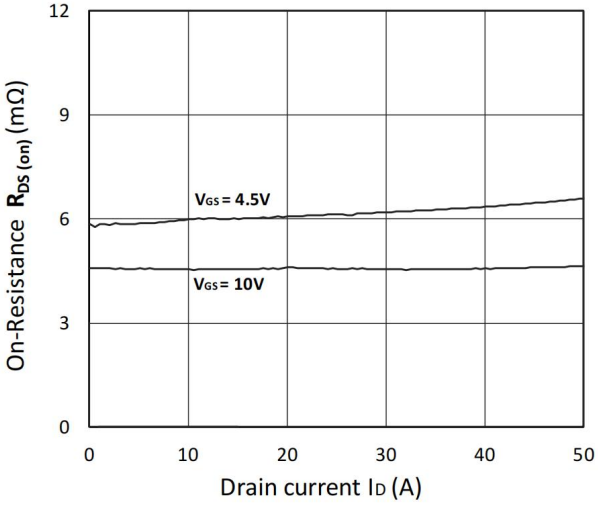
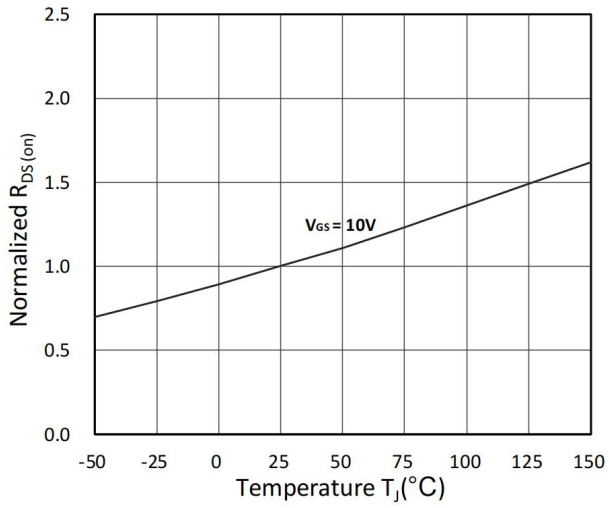


Figure 6: Normalized RDS(on) vs. Temperature



Typical Characteristics (Ta=25℃, unless otherwise noted)

Figure 7: Capacitance Characteristics

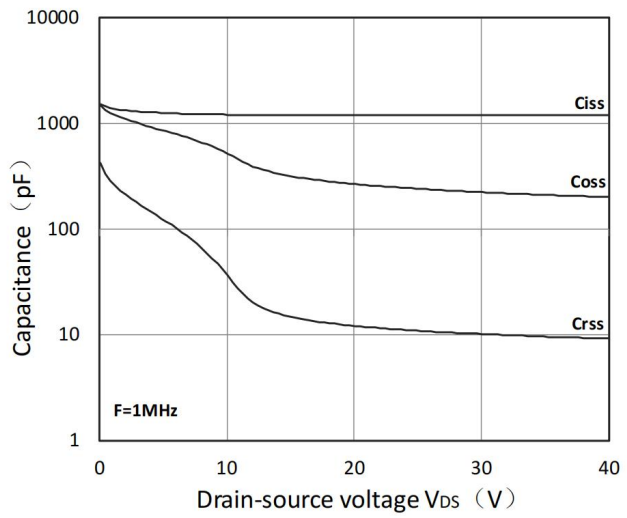


Figure 8: Gate Charge Characteristics

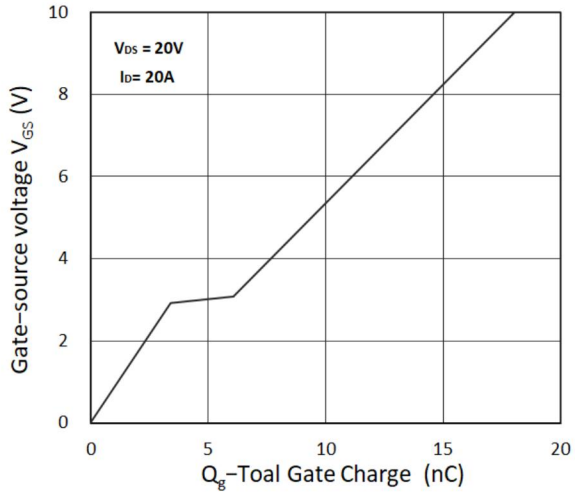


Figure 9: Safe Operating Area

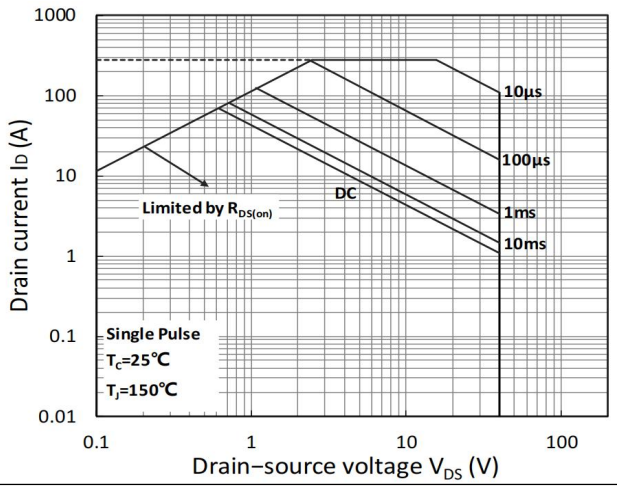


Figure 10. Power Dissipation

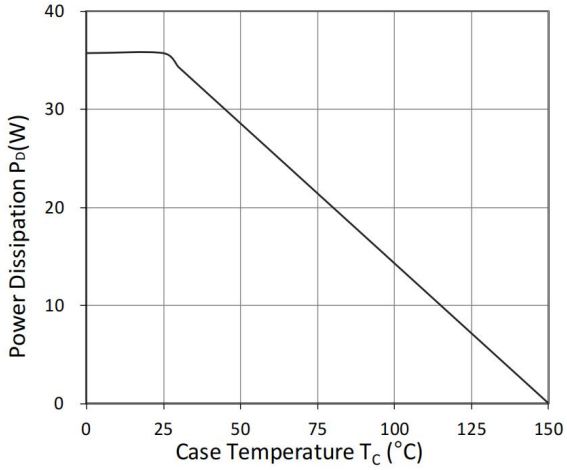
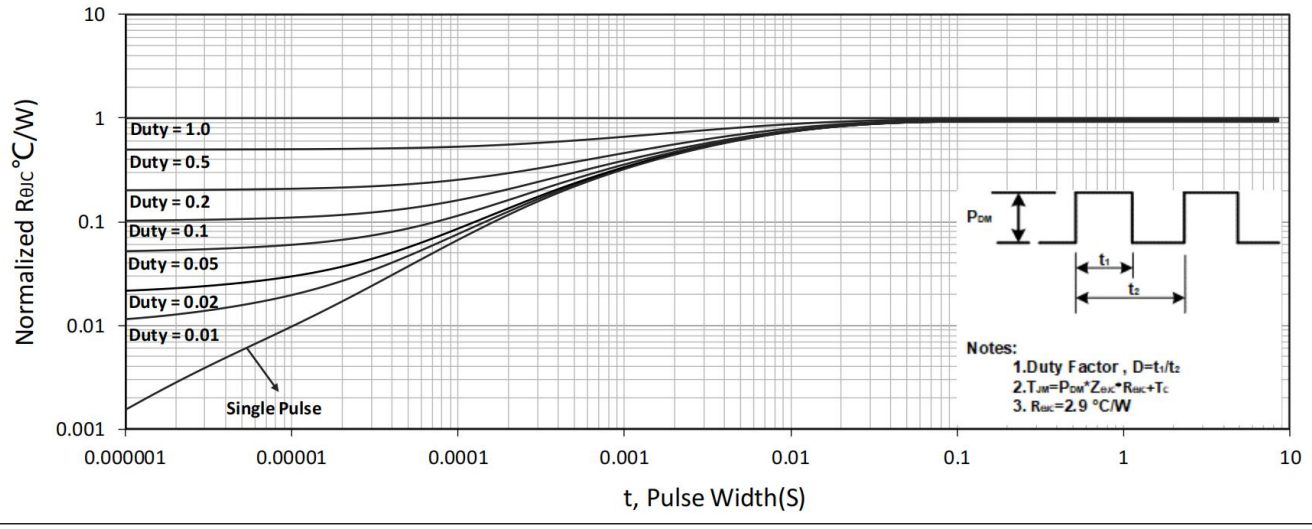
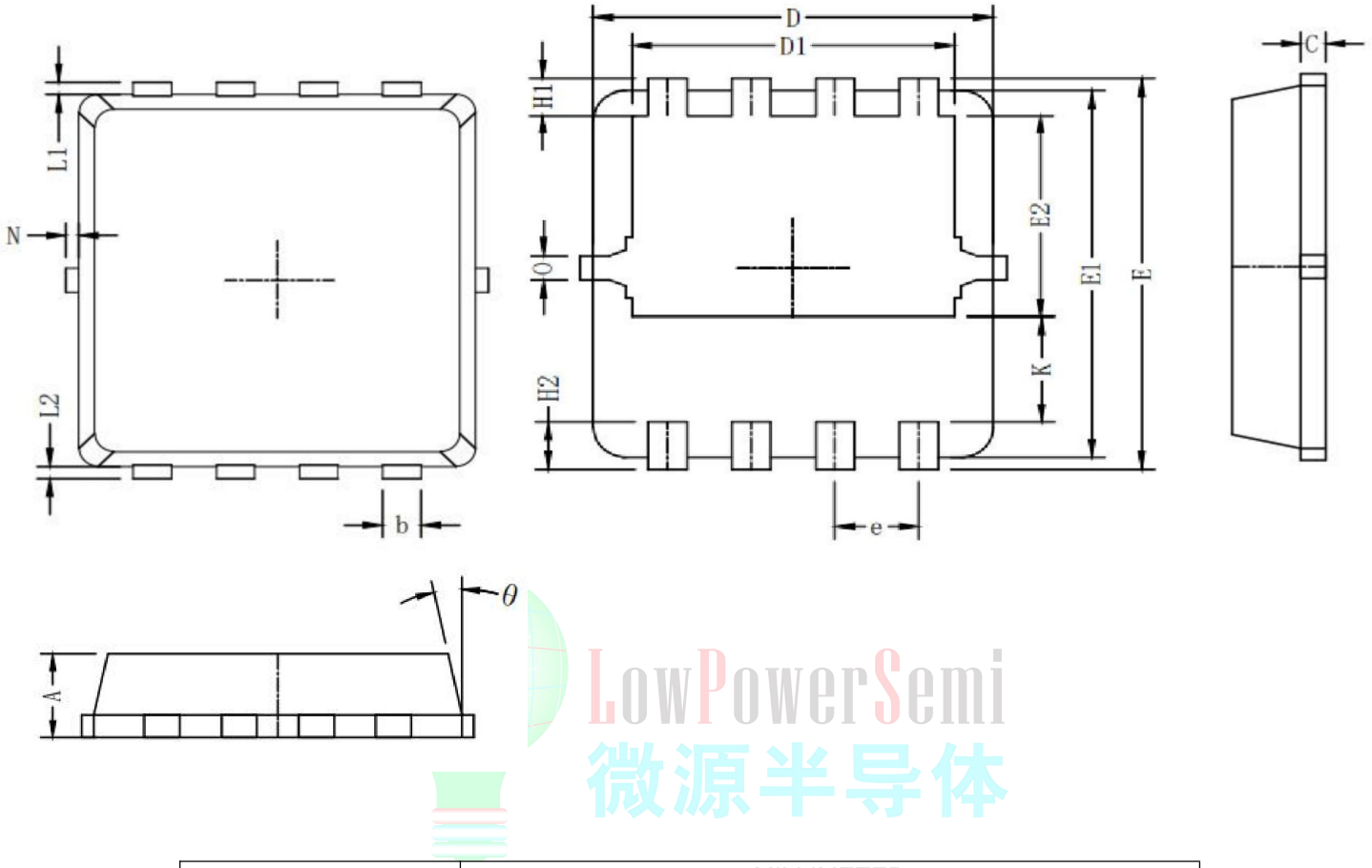


Figure 11: Normalized Maximum Transient Thermal Impedance



Packaging Information:

Mechanical Dimensions for PDFN3030-8L



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.7	0.8	0.9
b	0.25	0.325	0.4
C	0.15	0.20	0.25
D	2.95	3.15	3.35
D1	2.3	2.5	2.7
E	3.1	3.3	3.5
E1	2.9	3.0	3.3
E2	1.60	1.82	2.0
e	0.65BSC		
H2	0.300	0.40	0.50
L1/L2	0.10	0.15	0.25
θ	11°	12°	13°