N-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY

BV_{DSS}	60V
$R_{DSON(MAX.)}$	0.003Ω
I_D	120A

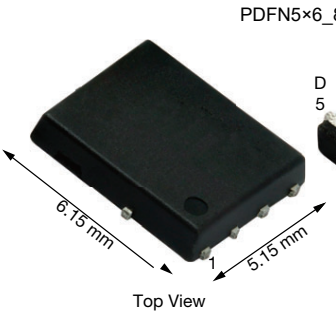
FEATURES

- SGT technology Power MOSFET
- Material categorization:

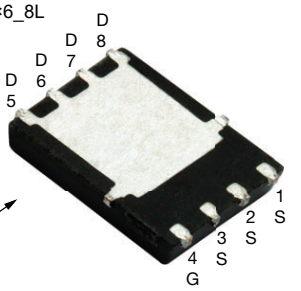
RoHS COMPLIANT
HALOGEN FREE

APPLICATIONS

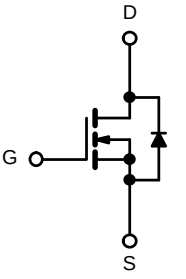
- Power managemen t functions
- Synchronous Rectifier
- DC/DC Converter



Top View



Bottom View



N-Channel MOSFET

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current@10V	T_C = 25 °C	I_D	120	A
	T_C = 100 °C		79	
Pulsed Drain Current		I_{DM}	500	A
Single Pulse Avalanche Energy	L = 0.1 mH	E_{AS}	352.8	mJ
Avalanche Current		I_{AS}	40	A
Total Power Dissipation	T_C = 25 °C	P_D	96	W
Operating Junction and Storage Temperature Range		T_J , T_{STG}	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	TYP.	MAX.	Unit
Thermal resistance, junction-to-ambient	$R_{\theta JA}$	-	48	°C / W
Thermal resistance, junction-to-case	$R_{\theta JC}$	-	1.3	

Electrical Characteristics T_J = 25°C, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V , I_D = 250 μA	60	-	-	V
Gate-body Leakage current	I_{GSS}	V_{DS} = 0 V , V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V , V_{GS} = 0 V , T_J = 25 °C	-	-	1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250 μA	2		4	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V , I_D = 19 A	-	0.0024	0.003	Ω
Forward Transconductance	g_{fs}	V_{DS} = 10 V , I_D = 19 A	-	89	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 30 V , V_{GS} = 0 V , f = 1 MHz	-	4072	-	pF
Output Capacitance	C_{oss}		-	1055	-	
Reverse Transfer Capacitance	C_{rss}		-	33	-	
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 30 V , V_{GS} = 10 V , I_D = 50 A	-	70	-	nC
Gate-Source Charge	Q_{gs}		-	18	-	
Gate-Drain Charge	Q_{gd}		-	20.7	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 10 V , I_D ≅ 19 A , V_{GEN} = 10 V , R_G = 3 Ω	-	19	-	nS
Rise Time	t_r		-	18	-	
Turn-Off Delay Time	$t_{d(off)}$		-	42	-	
Fall Time	t_f		-	23	-	
Drain-Source Body Diode Characteristics						
Diode Forward Voltage	V_{SD}	I_S = 19 A , V_{GS} = 0 V	-	-	1.2	V
Continuous Source-Dranin Diode Current	I_S	T_J = 25 °C	-	-	120	A
Continuous Source Current	I_{SM}		-	-	240	A
Reverse Recovery Charge	Q_{rr}	T_J = 25 °C , I_F = 19 A , dI/dt = 100 A/μs	-	10	-	nC
Reverse Recovery Time	t_{rr}		-	45	100	ns

Notes：

a. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

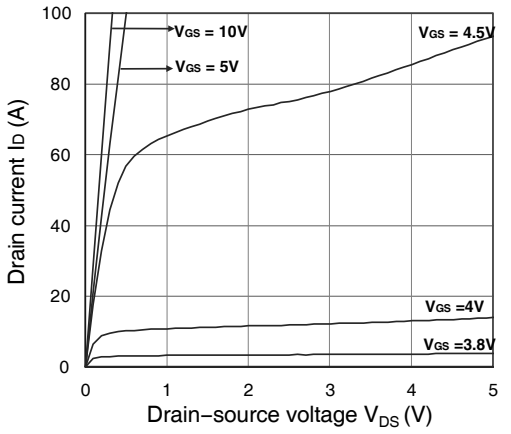
b. The EAS data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V, L=0.4mH, I_{AS}=40A.

c. 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.

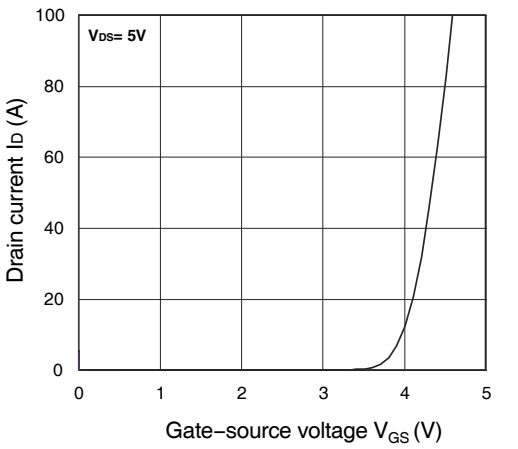
d. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.

e. This value is guaranteed by design hence it is not included in the production test.

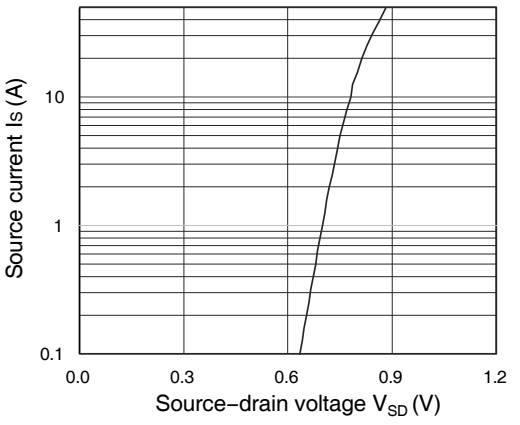
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



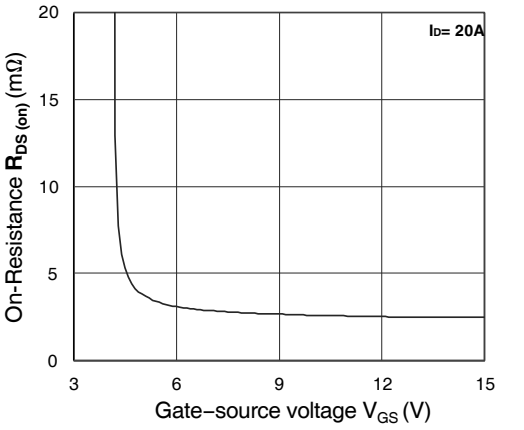
Output Characteristics



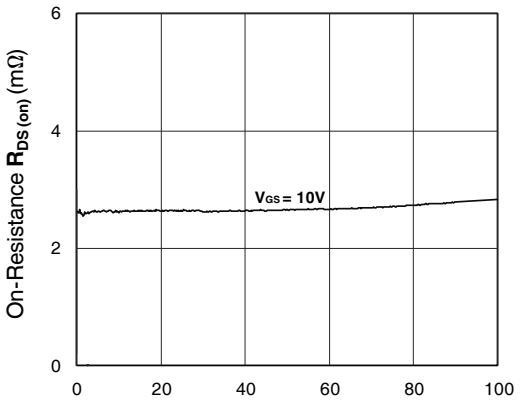
Transfer Characteristics



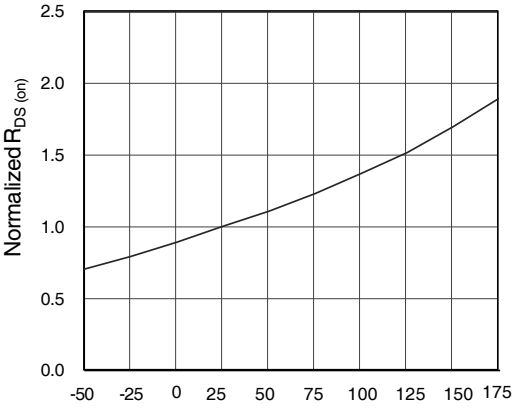
Forward Characteristics of Reverse



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

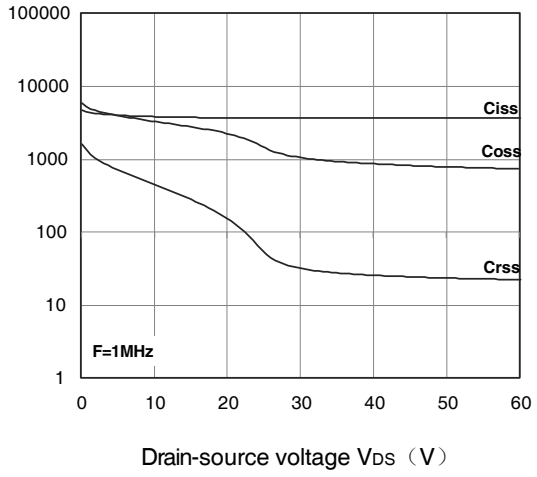


$R_{DS(ON)}$ vs. I_D

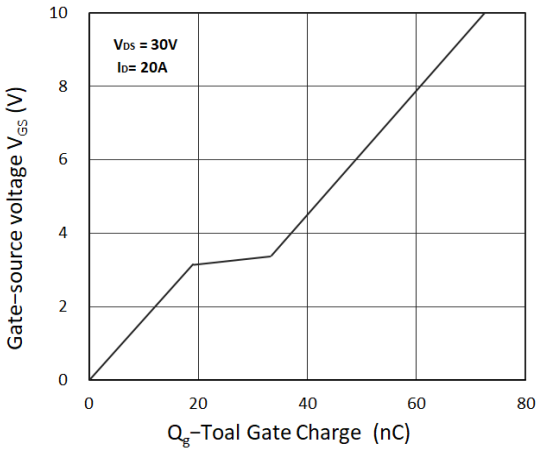


Normalized $R_{DS(on)}$ vs. Temperature

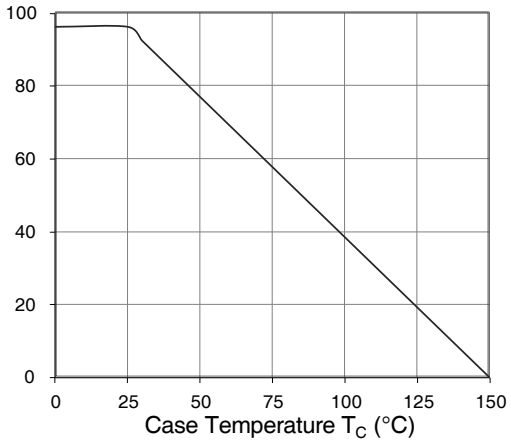
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



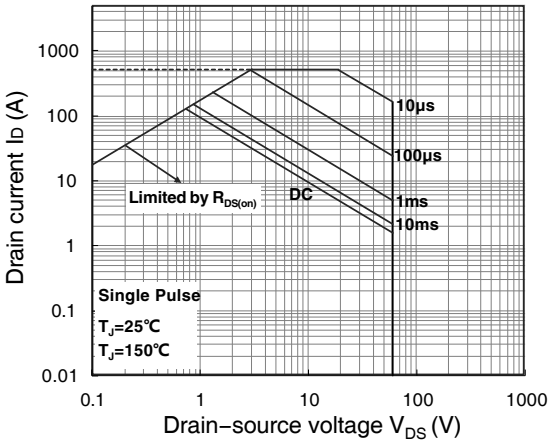
Capacitance Characteristics



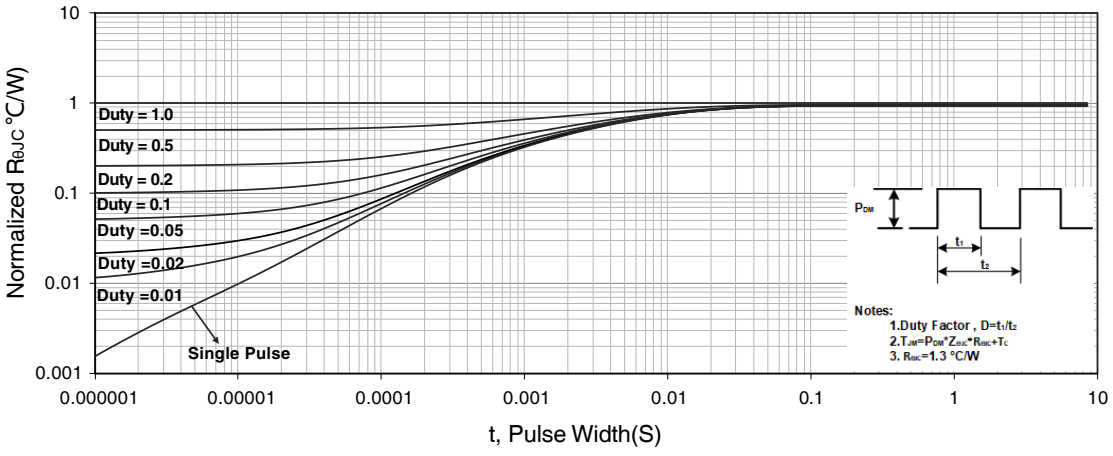
Gate Charge Characteristics



Power Dissipation



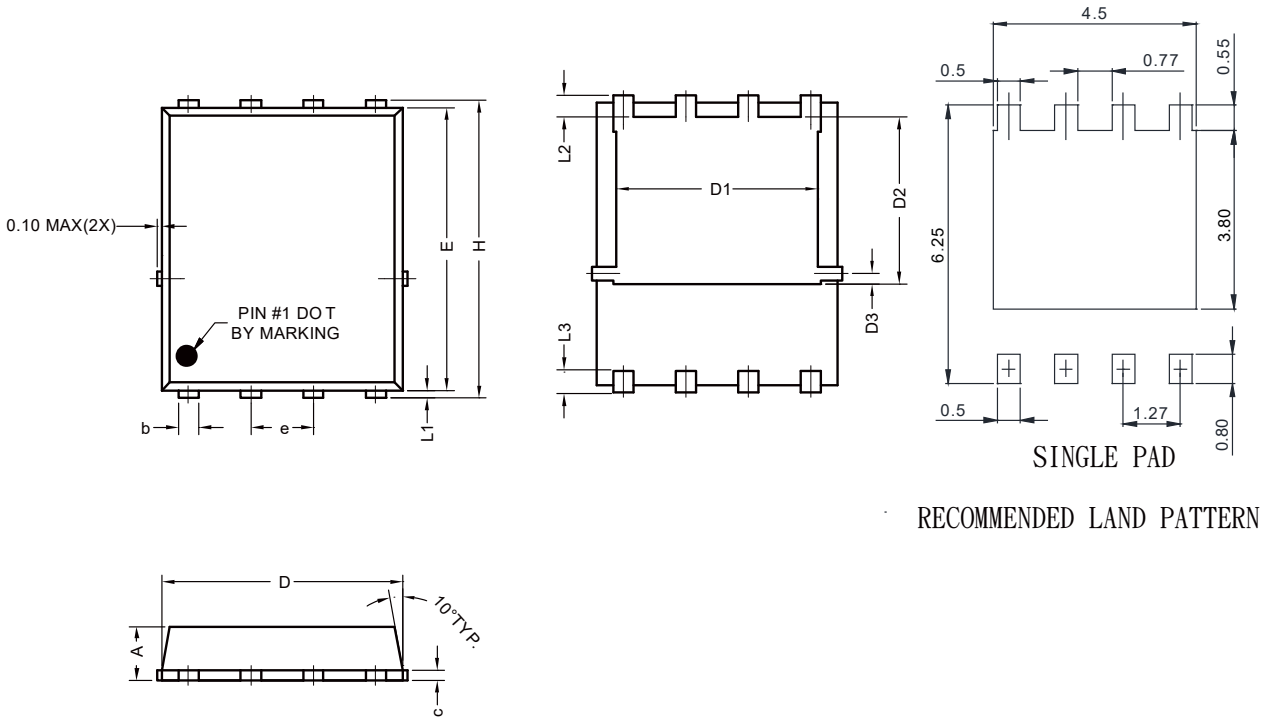
Safe Operating Area



Normalized Maximum Transient Thermal

Impedance

PDFN5×6-8L_EP1_P PACKGE OUTLIN



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.800	1.170	0.031	0.046
b	0.340	0.490	0.013	0.019
c	0.20	0.34	0.008	0.013
D	4.800	5.100	0.009	0.011
D1	3.800	4.200	0.150	0.165
D2	3.180	3.78	0.125	0.149
D3	0.150	0.360	0.006	0.142
E	5.650	5.900	0.222	0.232
e	1.270 TYP		0.050 TYP	
H	5.900	6.150	0.232	0.242
L1	0.050	0.250	0.002	0.010
L2	0.380	0.620	0.015	0.024
L3	0.380	0.75	0.015	0.030