N-Channel 40 V (D-S) MOSFET

PRODUCT SUMMARY

BV_{DSS}	40V
$R_{DSON(MAX.)}$	0.0012Ω
I_D	240A

FEATURES

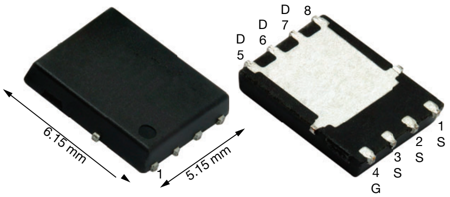
- SGT Technology Power MOSFET
- 150 °C Junction Temperature
- Qgd/Qgs ratio <1 optimizes switching characteistics

RoHS
COMPLIANT

APPLICATIONS

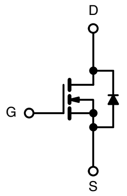
- Synchronous rectification
- OR-ing
- High power density DC/DC
- DC/AC inverters
- Load switch

PDFN5×6_8L



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}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current@10V	T_C = 25 ℃	I_D	240	A
	T_C = 100 ℃		140	
Pulsed Drain Current		I_{DM}	900	A
Single Pulse Avalanche Energy	L = 0.1 mH	E_{AS}	627.2	mJ
		I_{AS}	56	A
Total Power Dissipation	T_C = 25 ℃	P_D	114	W
Operating Junction and Storage Temperature Range		T_J , T_{STG}	-55 to +150	℃

Thermal Characteristics

Parameter		Symbol	Typ.	Max.	Unit
Thermal resistance, junction-to-ambient	t ≤ 10 s	$R_{θJA}$	-	50	℃/W
Thermal resistance, junction-to-case	Steady State	$R_{θJC}$	-	1.1	

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	40	-	-	V
Gate-body Leakage current		I_{GSS}	V_{DS} = 0 V , V_{GS} = ± 20 V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J = 25℃	I_{DSS}	V_{DS} = 40 V , V_{GS} = 0 V	-	-	1	µA
	T_J = 100℃		V_{DS} = 40 V , V_{GS} = 0 V	-	-	100	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250 µA	1		2.5	V
Drain-Source On-Resistance		$R_{DS(on)}$	V_{GS} = 10 V , I_D = 20 A	-	0.00075	0.0012	Ω
			V_{GS} = 4.5 V , I_D = 20 A	-	0.0012	0.0016	
Forward Transconductance		g_{fs}	V_{DS} = 10 V , I_D = 17 A	-	105	-	S
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS} = 20 V , V_{GS} = 0 V , f = 1 MHz	-	6652	-	pF
Output Capacitance		C_{oss}		-	1497	-	
Reverse Transfer Capacitance		C_{rss}		-	105	-	
Switching Characteristics							
Gate Resistance		R_g	f = 1 MHz	-	2.2	-	Ω
Total Gate Charge		Q_g	V_{GS} = 10 V , V_{DS} = 20 V , I_D = 17 A	-	120	-	Nc
Gate-Source Charge		Q_{gs}		-	21	-	
Gate-Drain Charge		Q_{gd}		-	24.2	-	
Turn-On Delay Time		$t_{d(on)}$	V_{DD} = 20 V , I_D ≅ 17 A , V_{GEN} = 10 V , R_G = 3 Ω	-	15.8	-	nS
Rise Time		t_r		-	16	-	
Turn-Off Delay Time		$t_{d(off)}$		-	93	-	
Fall Time		t_f		-	45	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage		V_{SD}	I_S = 17 A , V_{GS} = 0 V	-	-	1.2	V
Continuous Source-Dranin Diode Current		I_S	T_J = 25 °C	-	-	240	A
Pulse Diode Forward Currnt		I_{SM}		-	-	720	A
Reverse Recovery Time		t_{rr}	T_J = 25 °C , I_F = 17 A , dI/dt = 100 A/µs	-	68	-	ns
Reverse Recovery Charge		Q_{rr}		-	41.6	-	µC

Notes:

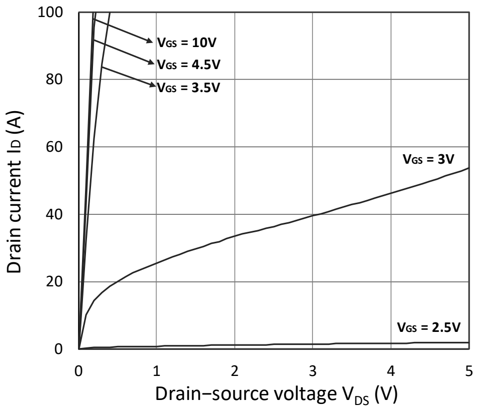
a. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

b. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.4mH, I_{AS}=56A.

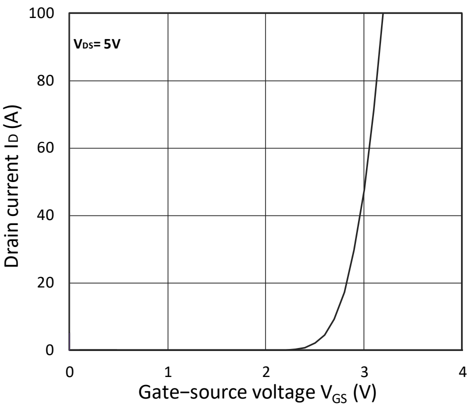
c. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.

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

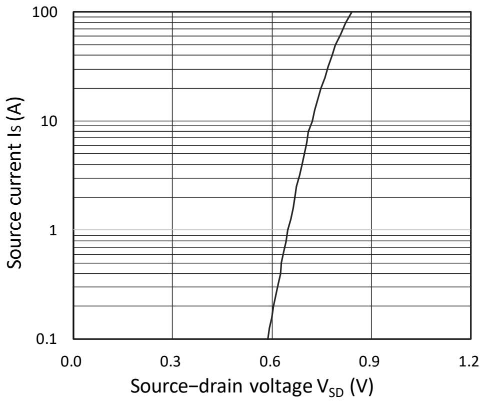
e. This value is guaranteed by design hence it is not included in the production test.



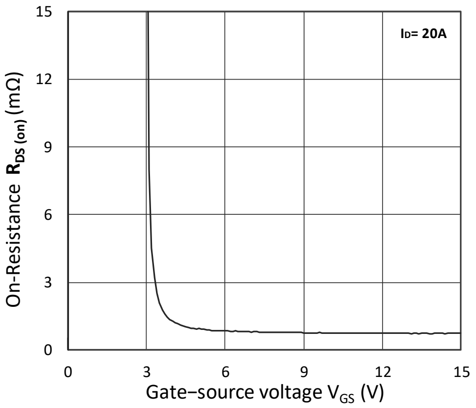
Output Characteristics



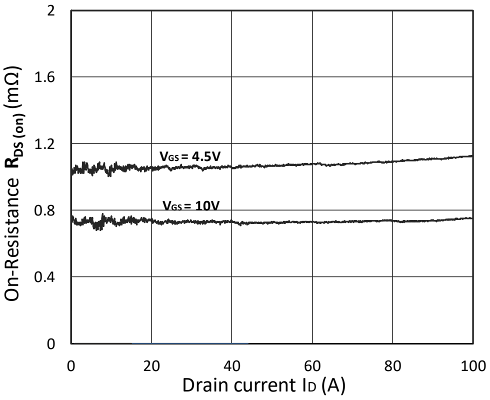
Transfer Characteristics



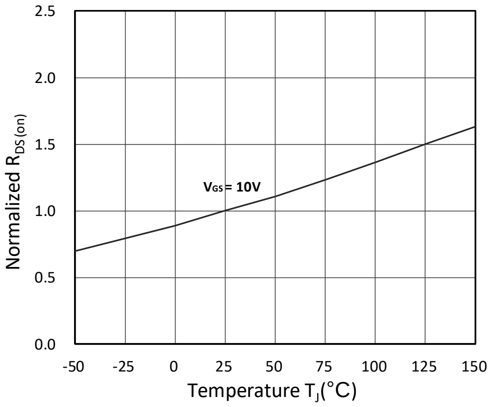
Forward Characteristics of Reverse



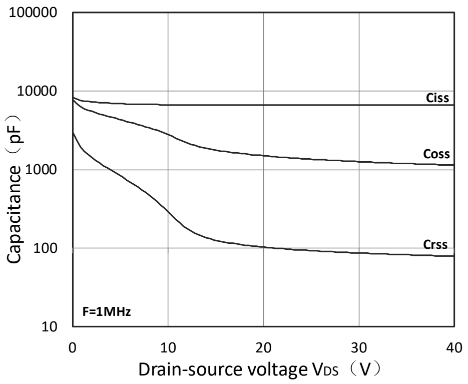
$R_{DS(ON)}$ vs. V_{GS}



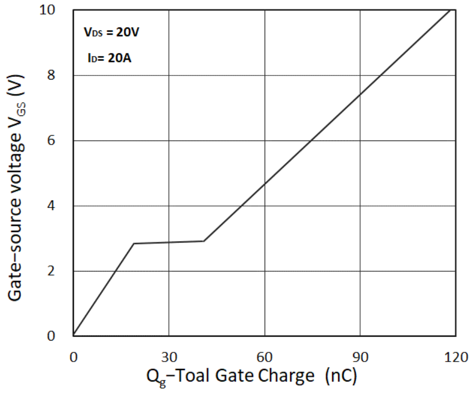
$R_{DS(ON)}$ vs. I_D



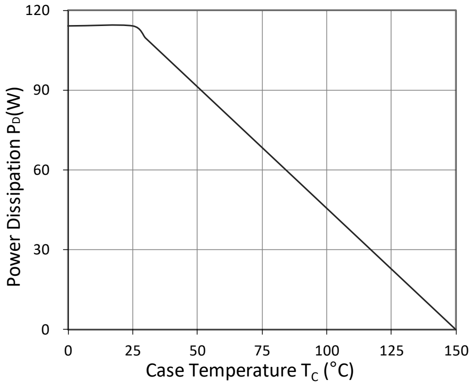
Normalized $R_{DS(on)}$ vs. Temperature



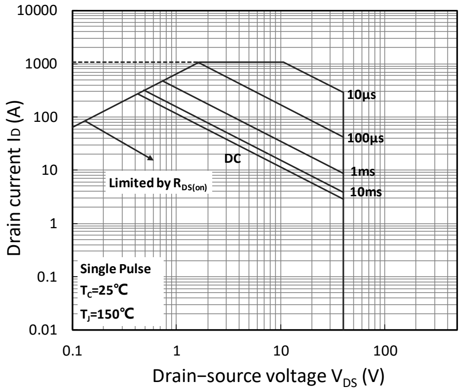
Capacitance Characteristics



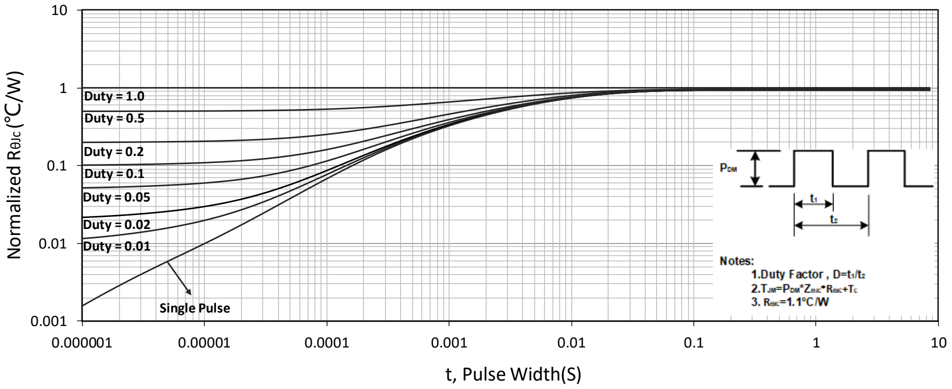
Gate Charge Characteristics



Power Dissipation

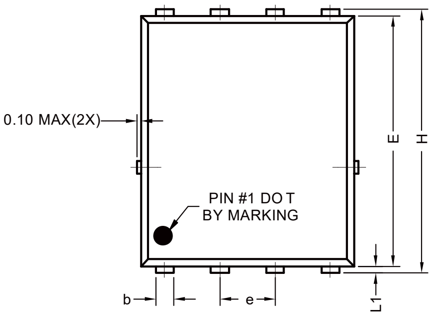


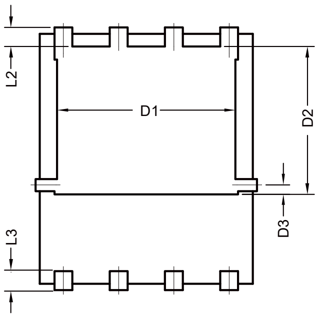
Safe Operating Area

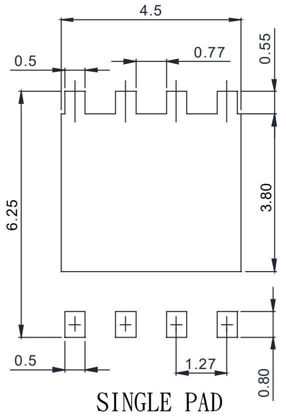


Normalized Maximum Transient Thermal Impedance

PDFN5×6-8L_EP1_P PACKGE OUTLIN

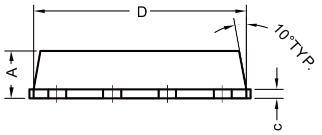






SINGLE PAD

RECOMMENDED LAND PATTERN



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