

N-Channel 120 V (D-S) MOSFET

PRODUCT SUMMARY

BV_{DSS}	120V
R_{DS(on)(MAX.)}	0.014Ω
I_D	70A

FEATURES

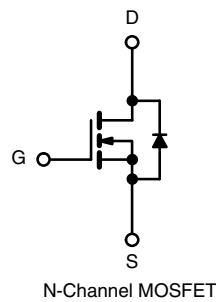
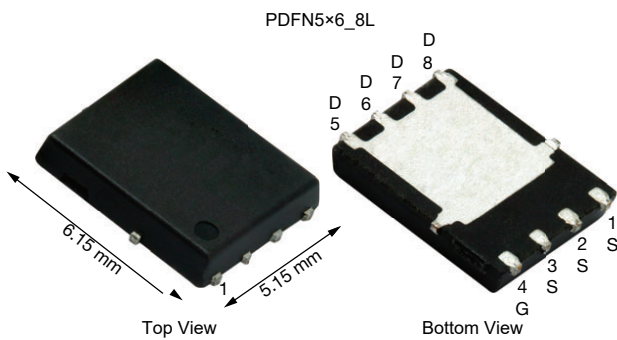
- SGT Technology Power MOSFET
- 150 °C Junction Temperature
- Qgd/Qgs ratio <1 optimizes switching characteristics



RoHS
COMPLIANT

APPLICATIONS

- High power density DC/DC
- DC/AC inverters
- Load switch
- Power management



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current@10V	I_D	T _C = 25 °C	70
		T _C = 100 °C	35
Pulsed Drain Current	I_{DM}	220	A
Single Pulse Avalanche Energy	E_{AS}	210	mJ
Total Power Dissipation	P_D	85	W
Operating Junction and Storage Temperature Range	T_J , T_{STG}	-55 to +150	°C

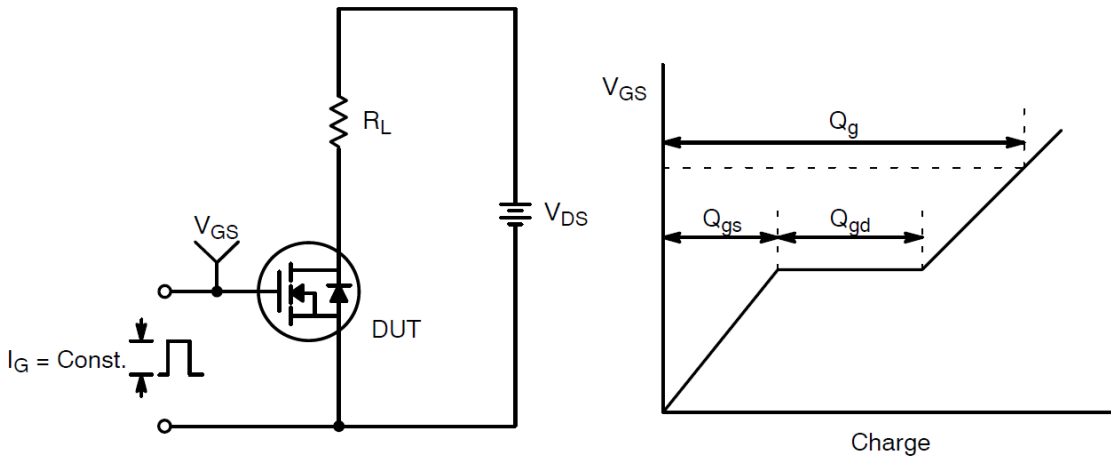
Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance, junction-to-case	R_{θJC}	-	1.47	°C / W

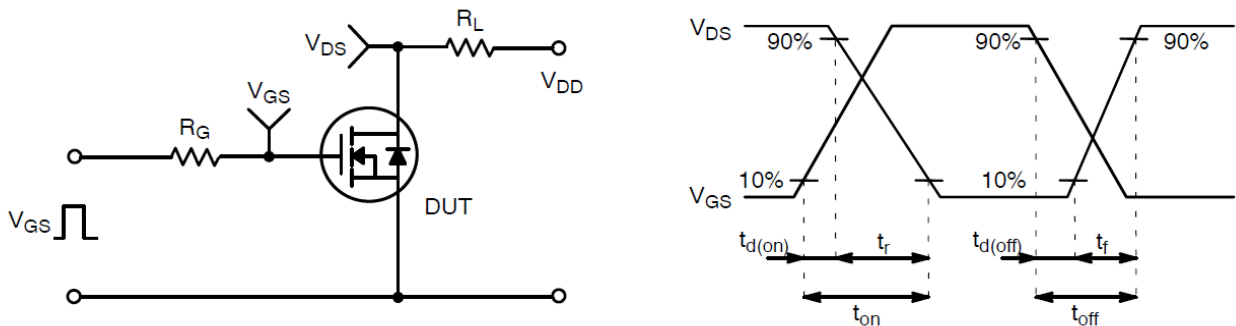
Electrical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$, $I_D = 250\ \mu\text{A}$	120	-	-	V
Gate-body Leakage current	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 120\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 25^\circ\text{C}$	-	-	1	μA
		$V_{DS} = 120\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 125^\circ\text{C}$	-	-	100	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	1.2		2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 84\text{ A}$	-	0.0115	0.014	Ω
		$V_{GS} = 4.5\text{ V}$, $I_D = 84\text{ A}$	-	0.013	0.0165	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$	-	1809	-	pF
Output Capacitance	C_{oss}		-	214	-	
Reverse Transfer Capacitance	C_{rss}		-	8	-	
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 60\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$	-	32	-	nC
Gate-Source Charge	Q_{gs}		-	9.6	-	
Gate-Drain Charge	Q_{gd}		-	7.7	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 60\text{ V}$, $I_D \cong 20\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_G = 5\ \Omega$	-	17	-	nS
Rise Time	t_r		-	12	-	
Turn-Off Delay Time	$t_{d(off)}$		-	34	-	
Fall Time	t_f		-	11	-	
Drain-Source Body Diode Characteristics						
Diode Forward Voltage	V_{SD}	$I_S = 84\text{ A}$, $V_{GS} = 0\text{ V}$	-	-	1.4	V
Continuous Source-Drain Diode Current	I_S	$T_J = 25^\circ\text{C}$	-	-	70	A
Continuous Source Current	I_{SM}		-	-	200	A
Reverse Recovery Charge	Q_{rr}	$T_J = 25^\circ\text{C}$, $I_F = 40\text{ A}$, $dI/dt = 100\text{ A}/\mu\text{s}$	-	10	-	nC
Reverse Recovery Time	t_{rr}		-	45	100	ns

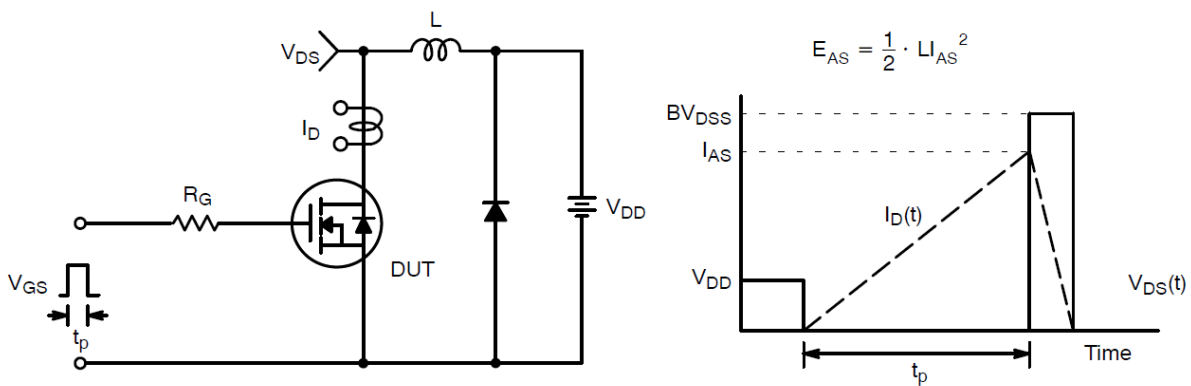
Test circuit and Waveform



Gate Charge Test Circuit & Waveform

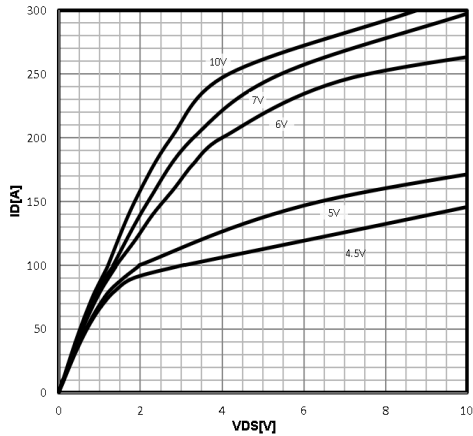


Resistive Switching Test Circuit & Waveforms



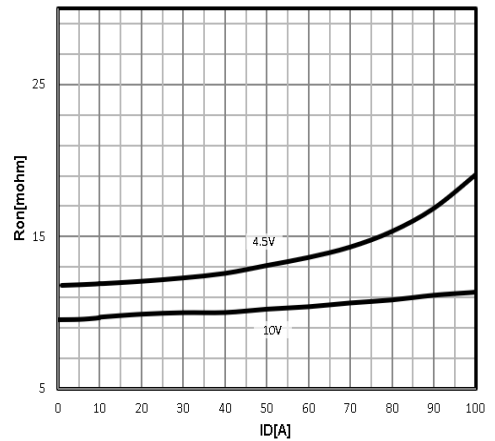
Unclamped Inductive Switching Test Circuit & Waveforms

TYPICAL CHARACTERISTICS (25 °C unless noted)



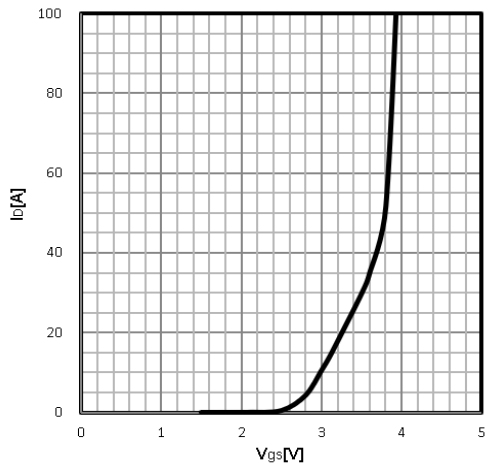
Typ. output characteristics

$I_D = f(V_{DS})$



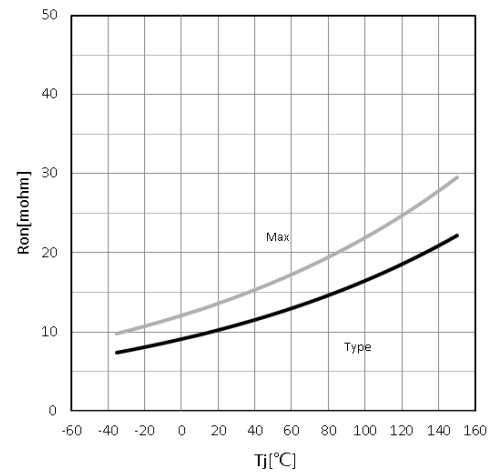
Typ. drain-source on resistance

$R_{DS(on)} = f(I_D)$



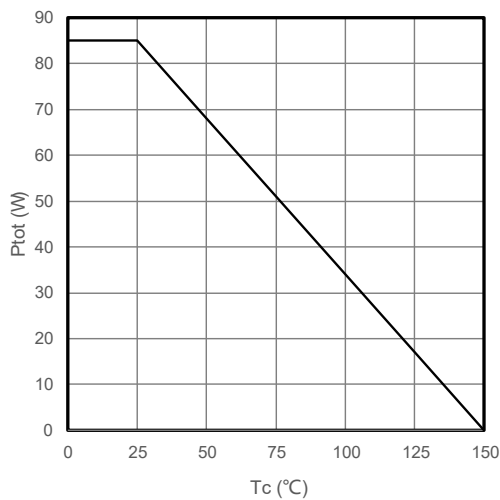
Typ. transfer characteristics

$I_D = f(V_{GS})$



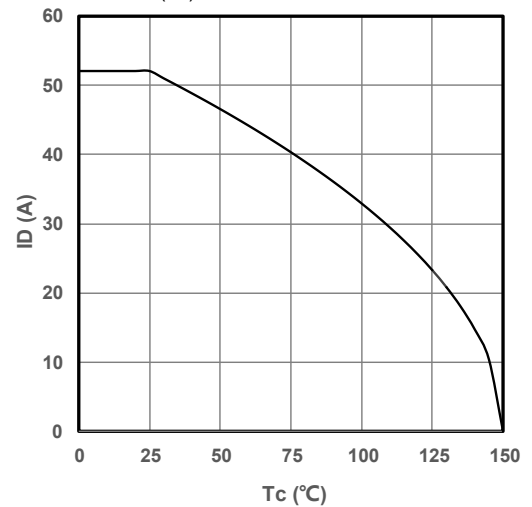
Drain-source on-state resistance

$R_{DS(on)} = f(T_j); I_D = 20A; V_{GS} = 10V$



Power Dissipation

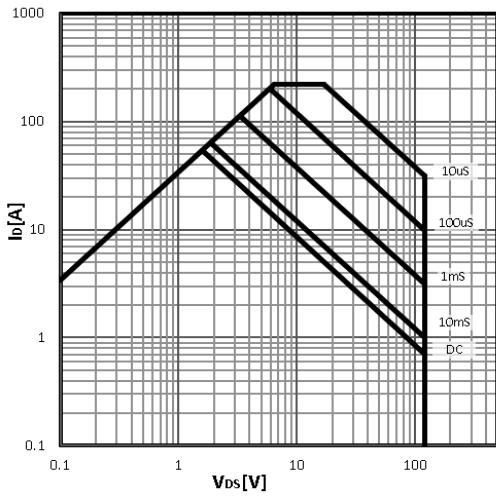
$P_{tot} = f(T_c)$



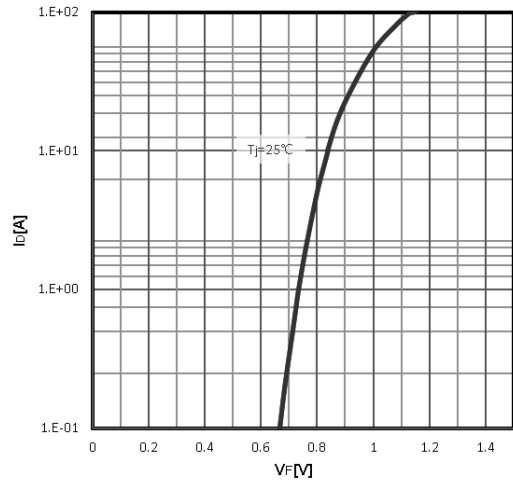
Maximum Drain Current

$I_D = f(T_c)$

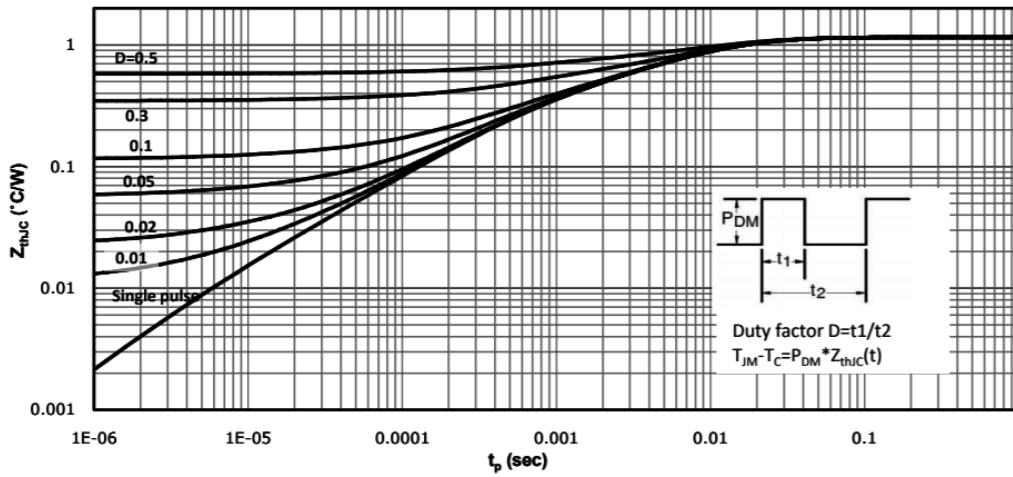
TYPICAL CHARACTERISTICS (25 °C unless noted)



Safe operating area
 $I_D=f(V_{DS})$

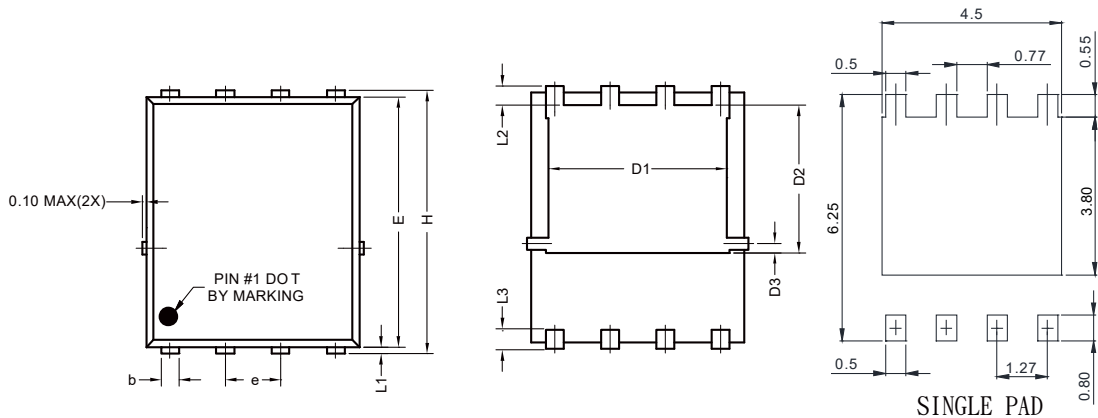


Body Diode Forward Voltage Variation
 $I_F=f(V_{GS})$

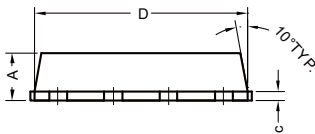


Max. transient thermal impedance
 $Z_{thJC}=f(t_p)$

PDFN5x6-8L_EP1_P PACKAGE OUTLIN



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