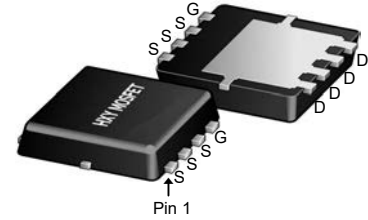




Description

The SM6536D1RL uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



DFN5X6-8L

General Features

$V_{DS} = 30V$ $I_D = 50A$

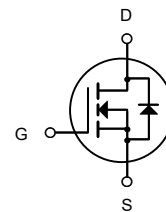
$R_{DS(ON)} < 8.5m\Omega$ $V_{GS} = 10V$

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
SM6536D1RL	DFN5X6-8L	HXY MOSFET	5000

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	60	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	38	A
I_{DM}	Pulsed Drain Current ²	200	A
EAS	Single Pulse Avalanche Energy ³	36	mJ
I_{AS}	Avalanche Current	50	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ⁴	31	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	27	$^\circ C/W$



Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μA	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =24V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0A	---	---	±100	nA
V_{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μA	1.2	1.5	2.5	V
R_{DS(on)}	Drain-Source On Resistance ²	V _{GS} =10V, I _D =30A	---	6.5	8.5	mΩ
		V _{GS} =4.5V, I _D =15A	---	11	14	
G_{FS}	Forward Transconductance	V _{DS} =5V, I _D =30A	---	38	---	S
C_{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	1317	1844	pF
C_{oss}	Output Capacitance		---	163	228	
C_{rss}	Reverse Transfer Capacitance		---	131	183	
t_{d(on)}	Turn-On Delay Time	V _{DD} =15V, I _D =15A, R _L =Ω V _{GS} =15V, R _G =3.3Ω	---	4.6	9.2	ns
t_r	Rise Time		---	12.2	22	ns
t_{d(off)}	Turn-Off Delay Time		---	26.6	53	ns
t_f	Fall Time		---	8	16	ns
Q_g	Total Gate Charge		V _{GS} =4.5V, V _{DS} =15V, I _D =15A	---	21	17.6
Q_{gs}	Gate-Source Charge	---		2.35	5.9	nC
Q_{gd}	Gate-Drain "Miller" Charge	---		5.9	7.1	nC
V_{SD}	Source-Drain Diode Forward Voltage ²	V _{GS} =0V, I _S =1A	---	---	1	V
I_S	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	58	A
I_{SM}	Pulsed Source Current ^{2,5}		---	---	115	A
t_{rr}	Reverse Recovery Time	I _F =30A, di/dt=100A/μs, T _J =25°C	---	9.2	---	
Q_{rr}	Reverse Recovery Charge		---	2	---	



Typical Characteristics

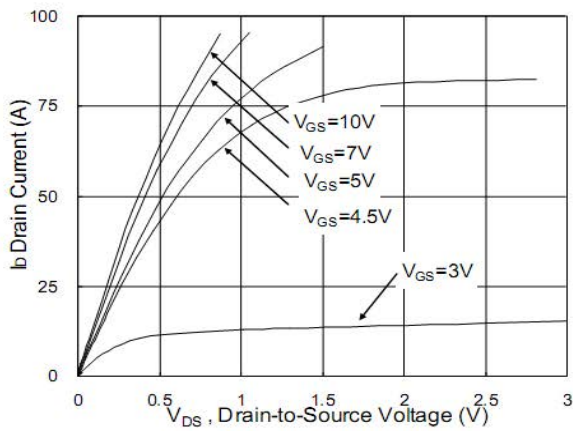


Fig.1 Typical Output Characteristics

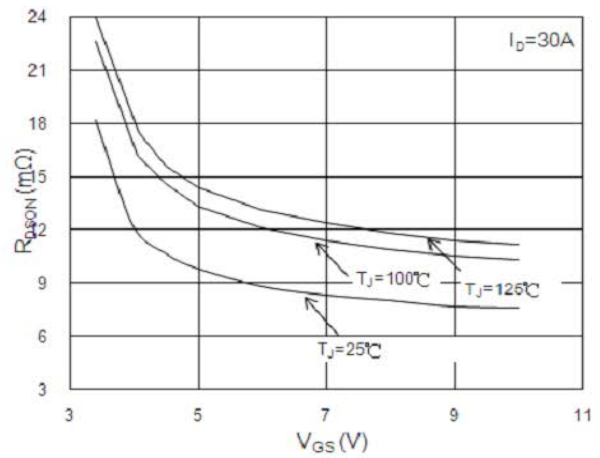


Fig.2 On-Resistance vs. Gate-Source

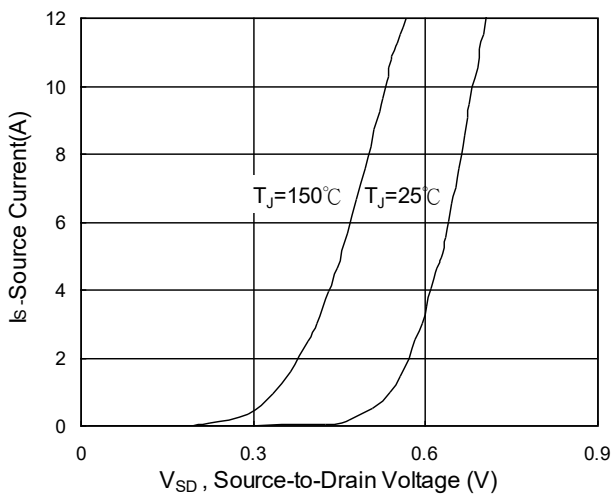


Fig.3 Forward Characteristics of reverse

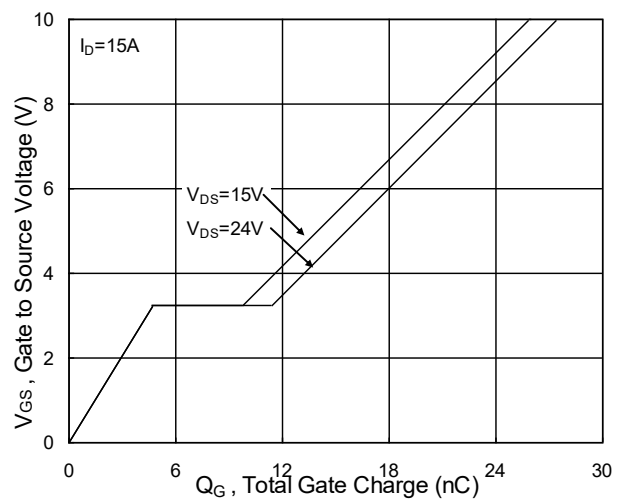


Fig.4 Gate-Charge Characteristics

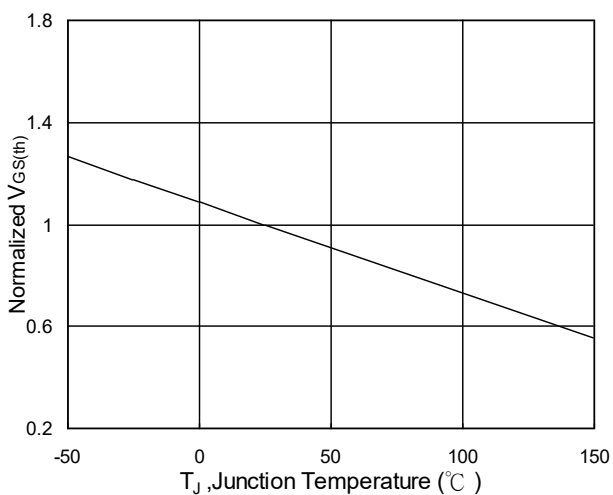


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

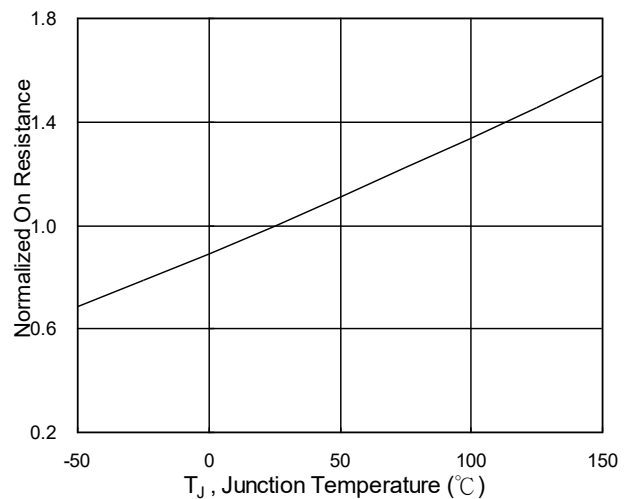


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

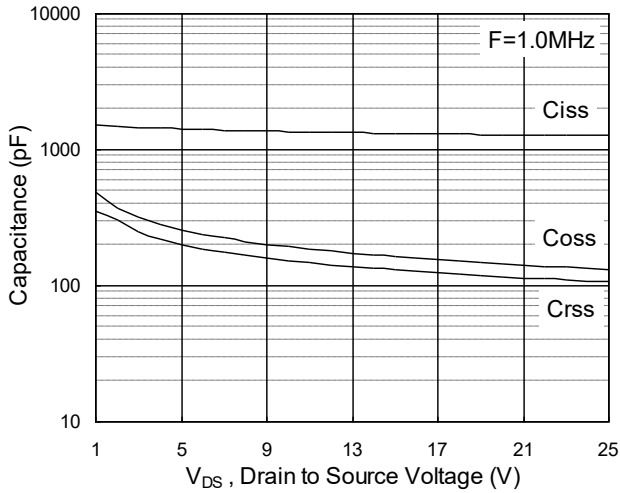


Fig.7 Capacitance

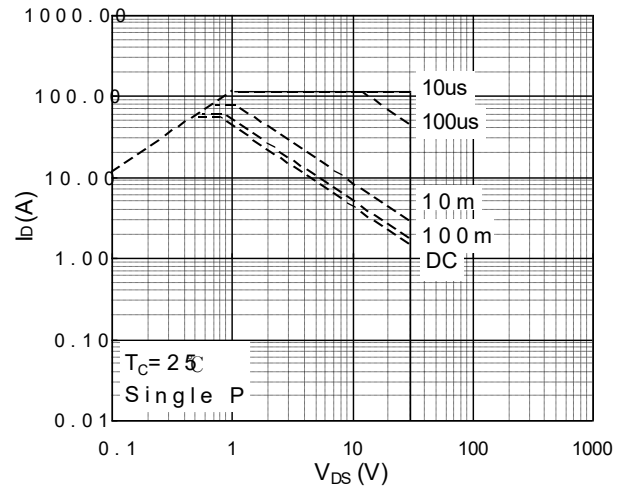


Fig.8 Safe Operating Area

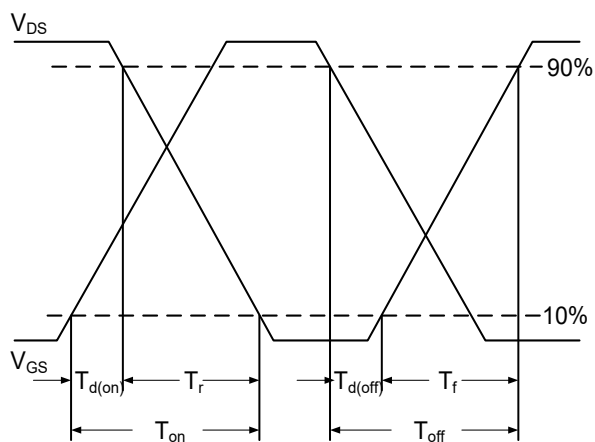
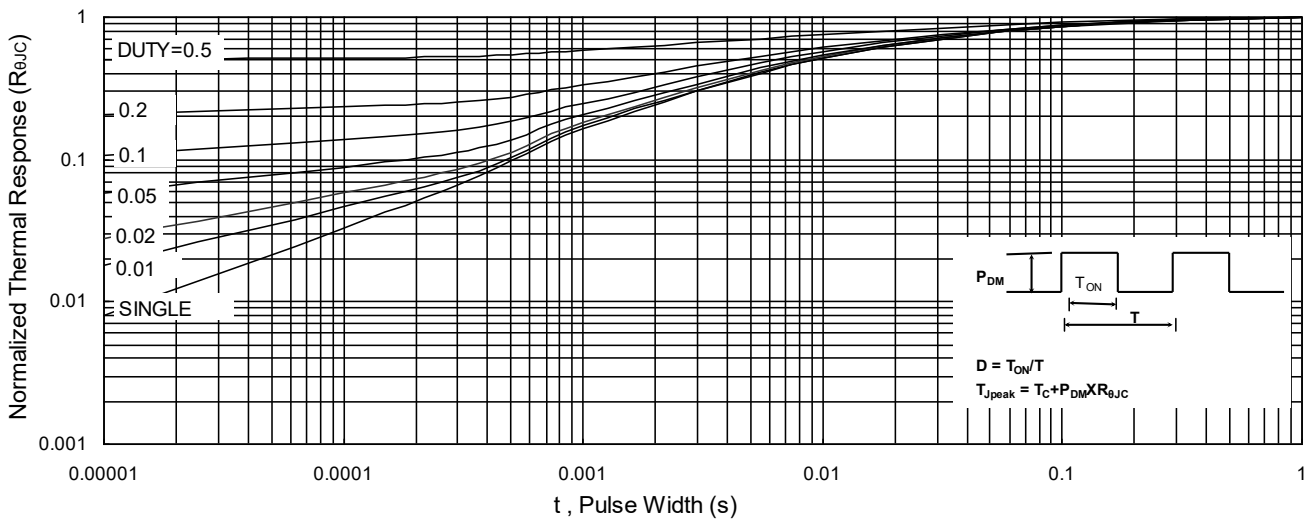
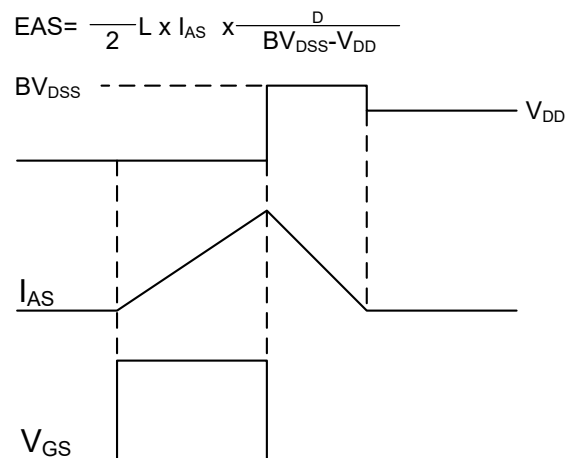
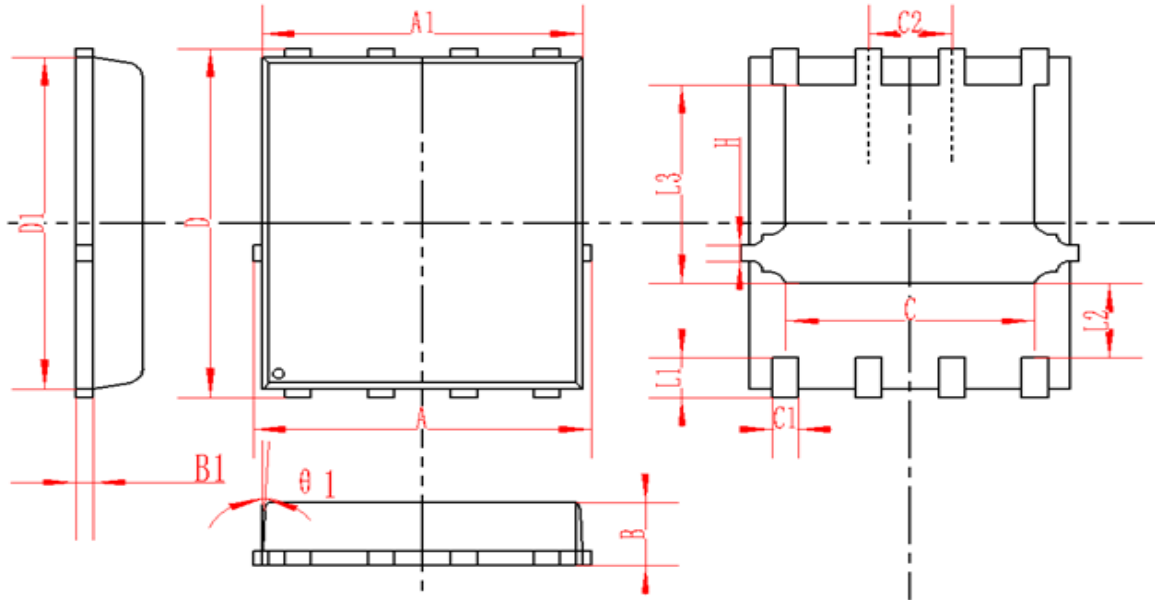


Fig.10 Switching Time Waveform





DFN5X6-8L Package Information



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.95	5	5.05	0.195	0.197	0.199
A1	4.82	4.9	4.98	0.190	0.193	0.196
D	5.98	6	6.02	0.235	0.236	0.237
D1	5.67	5.75	5.83	0.223	0.226	0.230
B	0.9	0.95	1	0.035	0.037	0.039
B1	0.254REF			0.010REF		
C	3.95	4	4.05	0.156	0.157	0.159
C1	0.35	0.4	0.45	0.014	0.016	0.018
C2	1.27TYP			0.5TYP		
$\theta 1$	8°	10°	12°	8°	10°	12°
L1	0.63	0.64	0.65	0.025	0.025	0.026
L2	1.2	1.3	1.4	0.047	0.051	0.055
L3	3.415	3.42	3.425	0.134	0.135	0.135
H	0.24	0.25	0.26	0.009	0.010	0.010



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