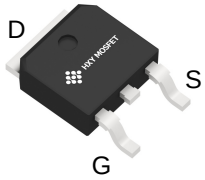
SUD50N06-09L-E3

N-Channel Enhancement Mode MOSFET

Description

The SUD50N06-09L-E3 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.

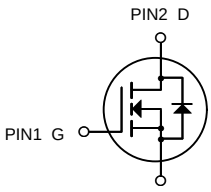


TO-252-2L

General Features

V_{DS} = 60V I_D =80 A

$R_{DS(ON)}$ < 8.3 mΩ @ V_{GS}=10V



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
SUD50N06-09L-E3	TO-252-2L	HXY MOSFET	2500

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	80	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	40	A
I_{DM}	Pulsed Drain Current[2]	255	A
I_{AS}	Avalanche Current	23	A
P_D@T_C=25℃	Total Power Dissipation[4]	100	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	62.5	℃/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	60	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=45A	-	6	8.3	mΩ
		V_{GS}=6V, I_D=30A	-	13	17	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	1.4	3	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=30A	-	71	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=60V, V_{GS}=0V	-	-	10	uA
	Drain-Source Leakage Current (T_j=125°C)	V_{DS}=48V ,V_{GS}=0V	-	-	250	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=30A V_{DS}=48V V_{GS}=4.5V	-	33	45	nC
Q_{gs}	Gate-Source Charge		-	5	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge		-	21	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=30V I_D=30A R_G=3.3Ω V_{GS}=10V	-	10	-	ns
t_r	Rise Time		-	43	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	47	-	ns
t_f	Fall Time		-	80	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V V_{DS}=25V f=1.0MHz	-	2680	3300	pF
C_{oss}	Output Capacitance		-	260	-	pF
C_{rss}	Reverse Transfer Capacitance		-	180	-	pF
V_{SD}	Forward On Voltage[2]	I_S=45A, V_{GS}=0V	-	-	1.3	V
t_{rr}	Reverse Recovery Time	I_S=10A, V_{GS}=0V, dI/dt=100A/μs	-	30	-	ns
Q_{rr}	Reverse Recovery Charge		-	18	-	nC

Typical Performance Characteristics

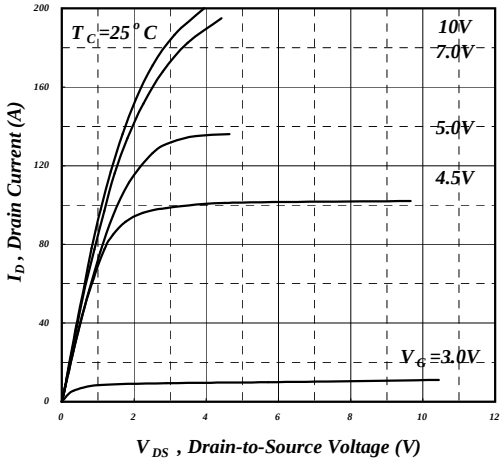


Fig 1. Typical Output Characteristics

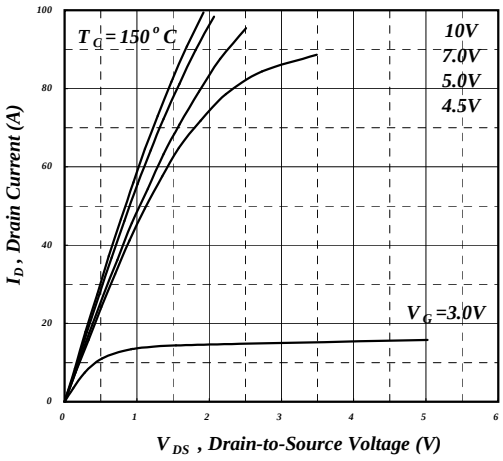


Fig 2. Typical Output Characteristics

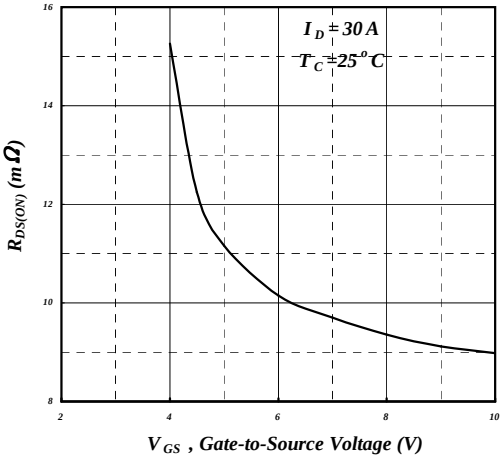


Fig 3. On-Resistance v.s. Gate Voltage

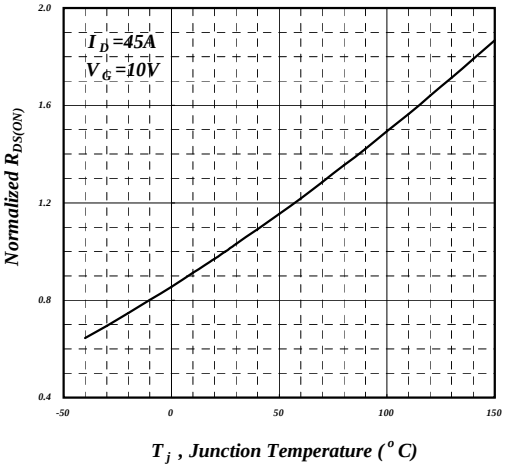


Fig 4. Normalized On-Resistance v.s. Junction Temperature

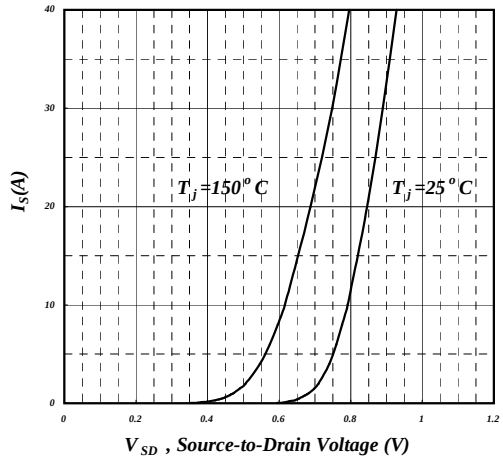


Fig 5. Forward Characteristic of Reverse Diode

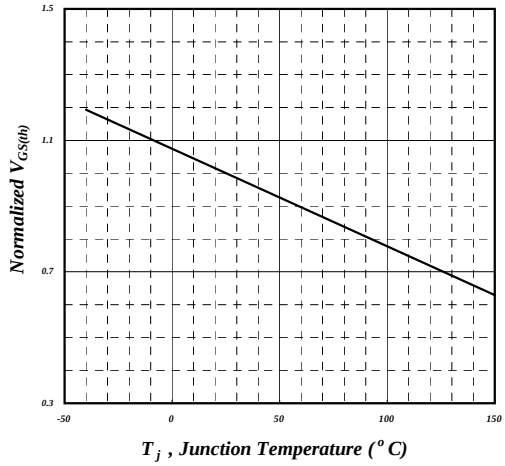


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

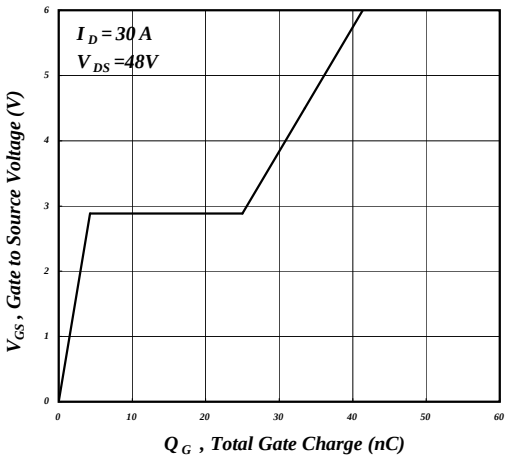


Fig 7. Gate Charge Characteristics

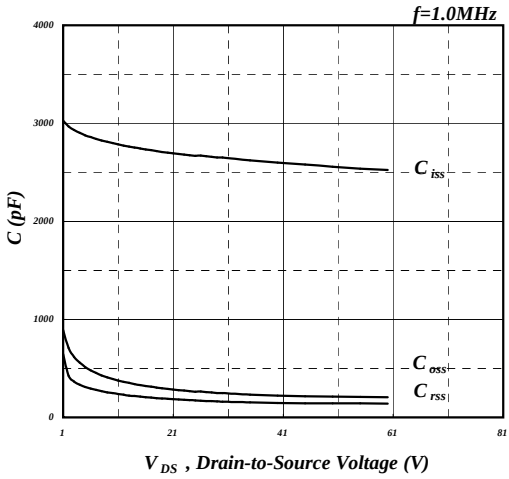


Fig 8. Typical Capacitance Characteristics

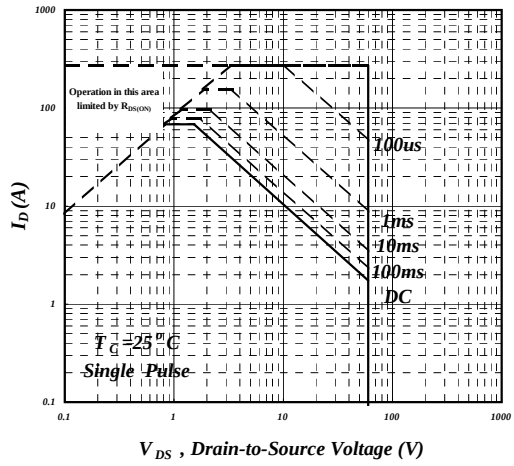


Fig 9. Maximum Safe Operating Area

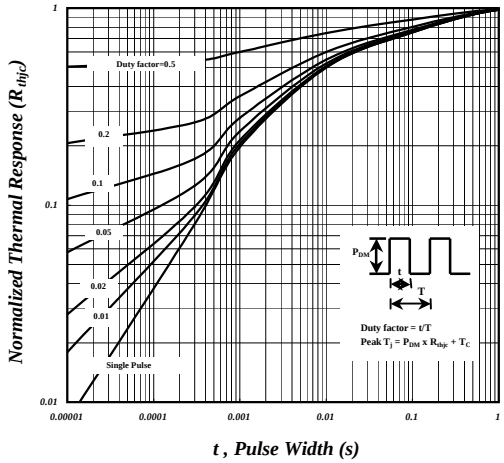


Fig 10. Effective Transient Thermal Impedance

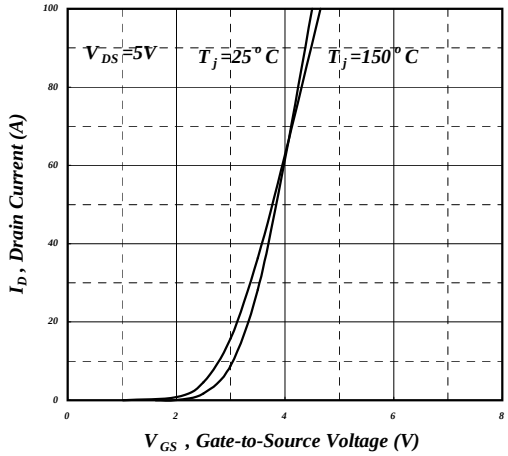


Fig 11. Transfer Characteristics

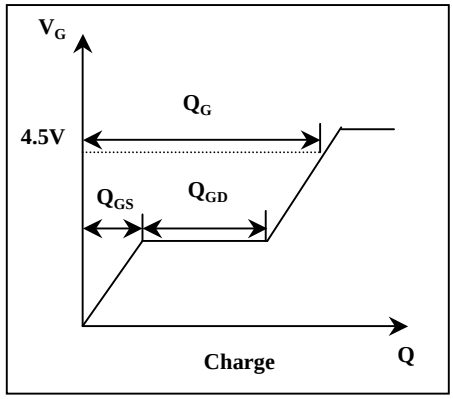
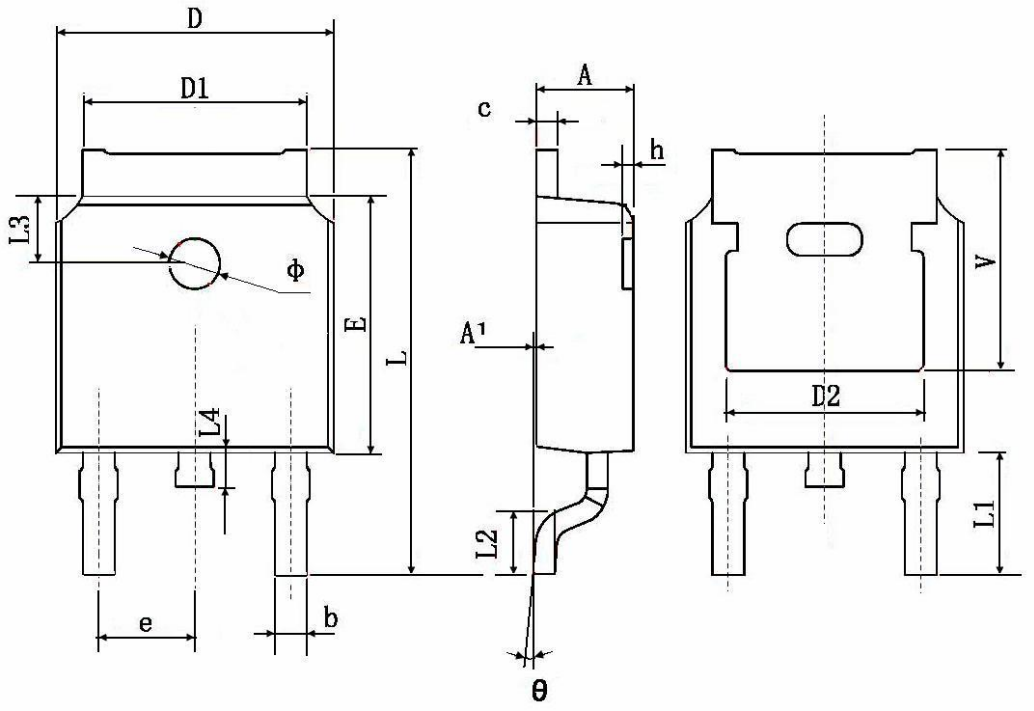


Fig 12. Gate Charge Waveform

TO-252-2L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	0.483 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

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