S65N07M
N-Channel Power MOSFET

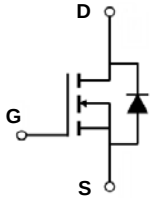
Features

- V_{DS}=65V,I_D=71A
  Rds(on)(typ)=6.8mΩ@Vgs=10V
- 100% Avalanche Tested
- 100% Rg Tested
- Lead-Free (RoHS Compliant)

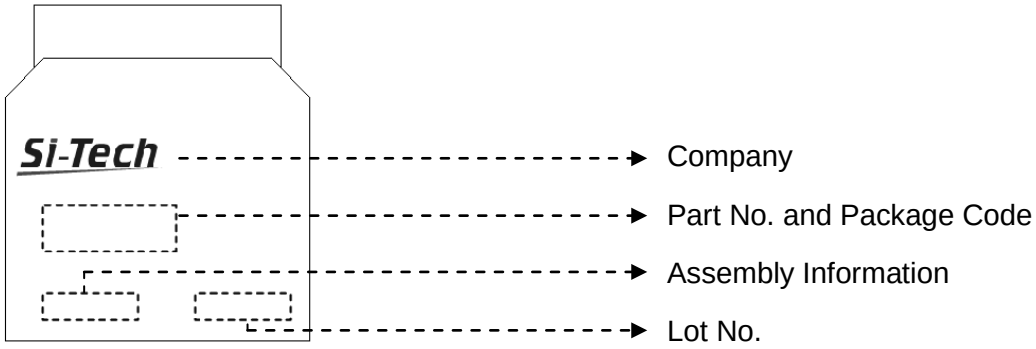
Applications

- DC Motor Control
- DC-DC Converters
- BMS
- SMPS
- Automotive Environment

Internal Circuit and Pin Description

	
Package	TO-252
Package Code	M

Package Marking



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

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	65	V
I_D	Continuous Drain Current (TC=25℃)	71	A
	Continuous Drain Current (TC=100℃)	45	A
I_{DM}	Pulsed Drain Current (Note 1)	284	A
V_{GS}	Gate-Source Voltage	±25	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	240	mJ
P_D	Maximum Power Dissipation (TC=25℃)	83	W
	Derating Factor above 25℃	0.66	W/℃
T_J	Operating Junction Temperature Range	-55 to +150	℃
T_{STG}	Storage Temperature Range	-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{th\ j\text{-}c}$	Thermal Resistance, Junction to case	1.5	℃/W

Electrical Characteristics (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	65	-	-	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=61.75V, V_{GS}=0V	-	-	1	uA
I_{GSS}	Gate Leakage Current, Forward	V_{GS}=25V, V_{DS}=0V	-	-	100	nA
	Gate Leakage Current, Reverse	V_{GS}=-25V, V_{DS}=0V	-	-	-100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250uA	2.4	3	3.6	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=40A	5.4	6.8	8	mΩ
Qg	Total Gate Charge	V_{DD}=40V	-	72	-	nC
Qgs	Gate-Source Charge	V_{GS}=10V	-	18	-	nC
Qgd	Gate-Drain Charge	I_D=40A (Note 3)	-	22	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=37.5V,V_{GS}=10V	-	27	-	ns
t_r	Turn-on Rise Time	I_D=45A,R_G=4.7Ω	-	25	-	ns
$t_{d(off)}$	Turn-off Delay Time	T_C=25℃	-	55	-	ns
t_f	Turn-off Fall Time	(Note 3)	-	50	-	ns
Rg	Gate Resistance	V_{DS}=0V,V_{GS}=0V,f=1MHz	-	1.1	-	Ω
Ciss	Input Capacitance	V_{DS}=25V	-	4168	-	pF
Coss	Output Capacitance	V_{GS}=0V	-	366	-	pF
Crss	Reverse Transfer Capacitance	f = 1MHz	-	272	-	pF

Source-Drain Diode Characteristics (T_C=25℃ unless otherwise noted)

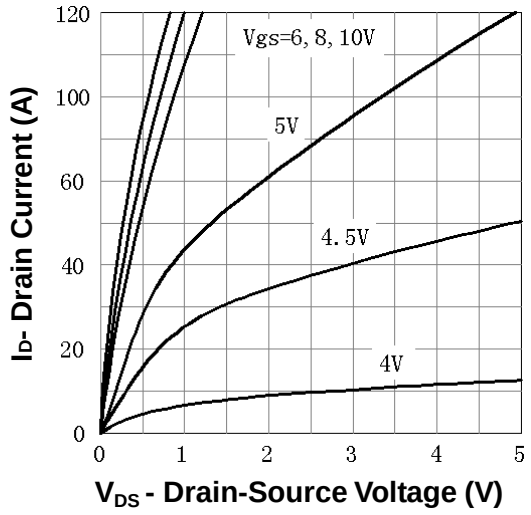
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Diode Forward Current		-	-	71	A
I_{SM}	Pulsed Source Diode Forward Current (Note 1)		-	-	284	A
V_{SD}	Forward On Voltage	V_{GS}=0V, I_S=45A	-	0.89	1	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V, I_S=45A	-	35	-	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt = 100A/us	-	54	-	nC

Notes：

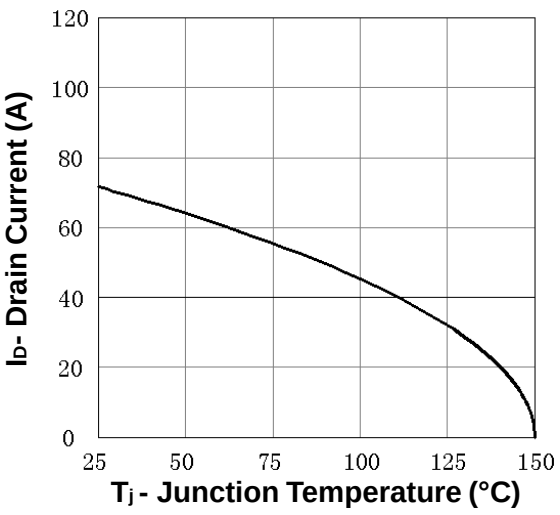
1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L=0.5mH, V_{DD}=48V, R_G=25Ω, Starting T_J=25℃
3. Pulse Width ≤ 300 us; Duty Cycle≤2%

Typical Characteristics

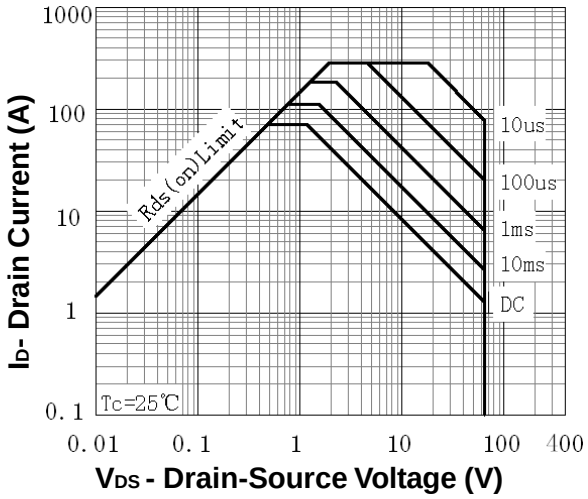
Output Characteristics



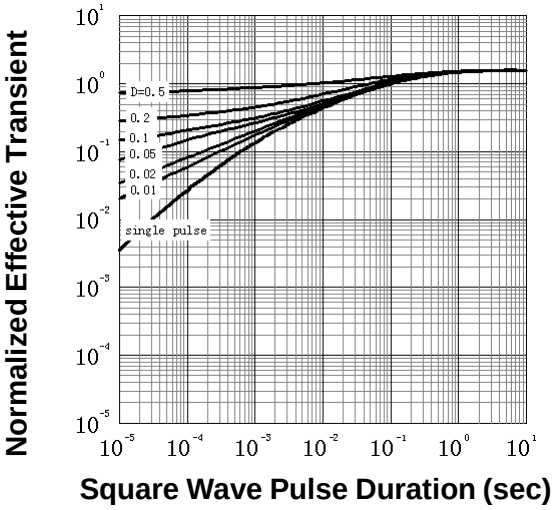
Drain Current



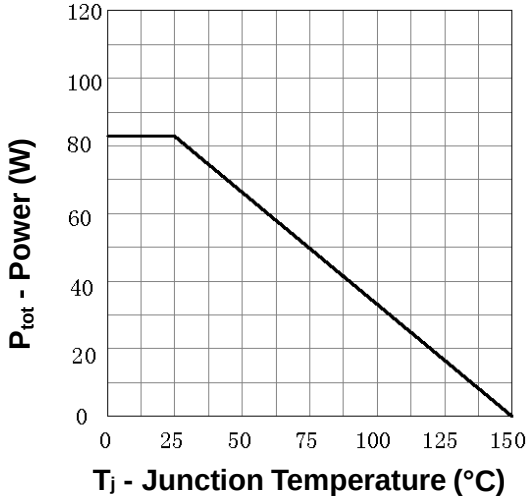
Safe Operation Area



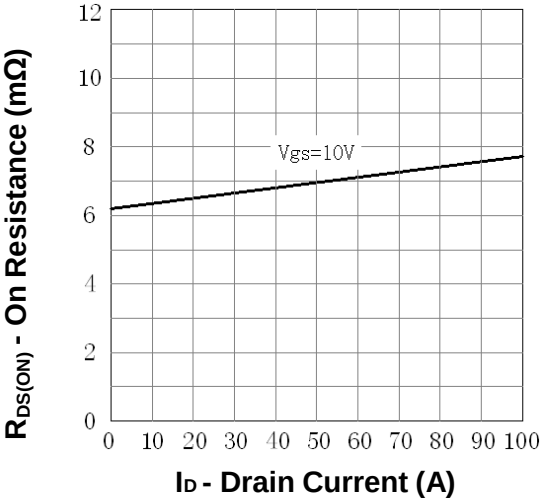
Thermal Transient Impedance



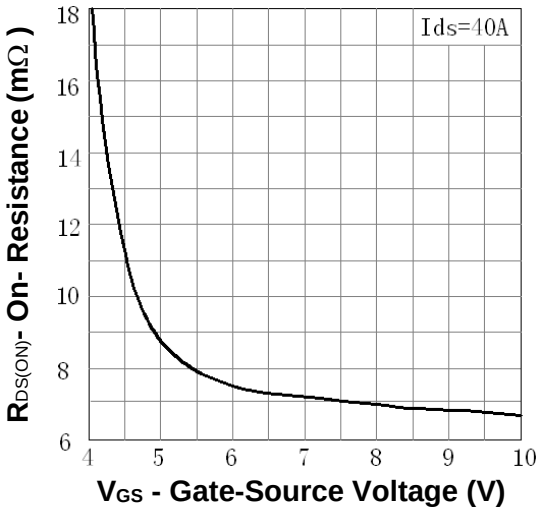
Power Dissipation



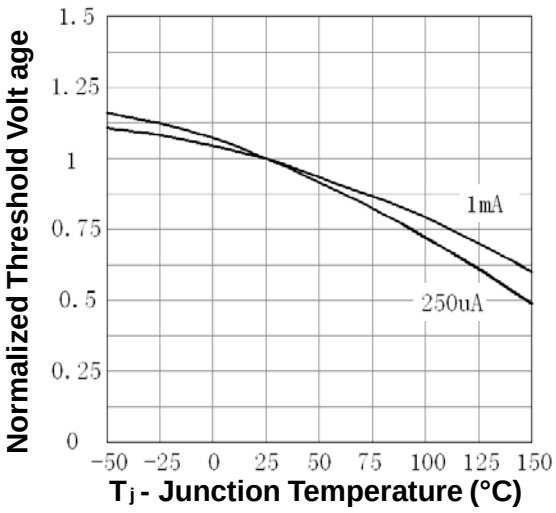
Drain-Source On Resistance



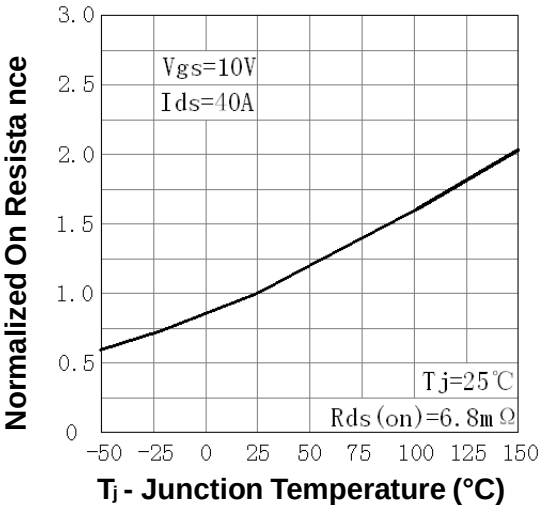
Drain-Source On Resistance



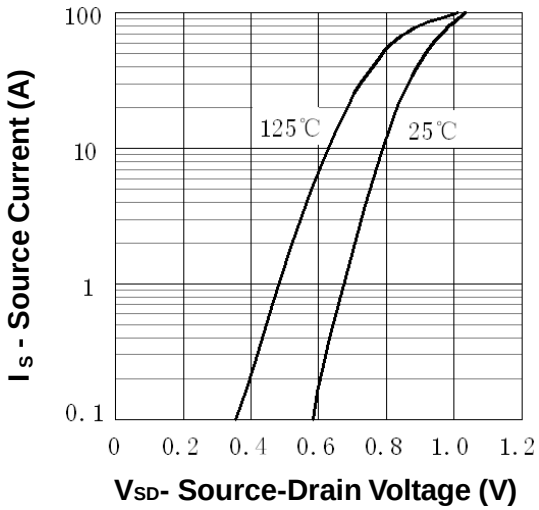
Gate Threshold Voltage



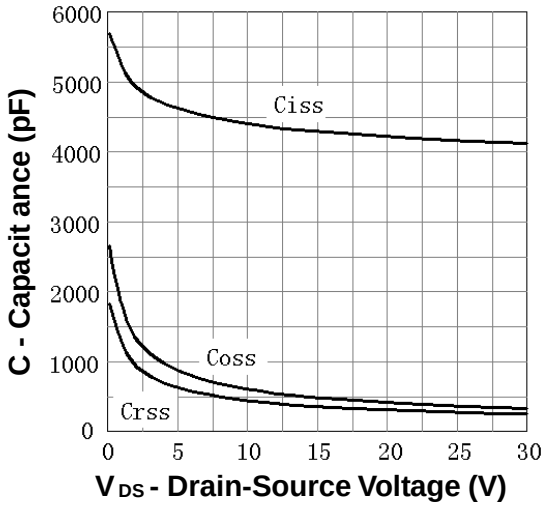
Drain-Source On Resistance



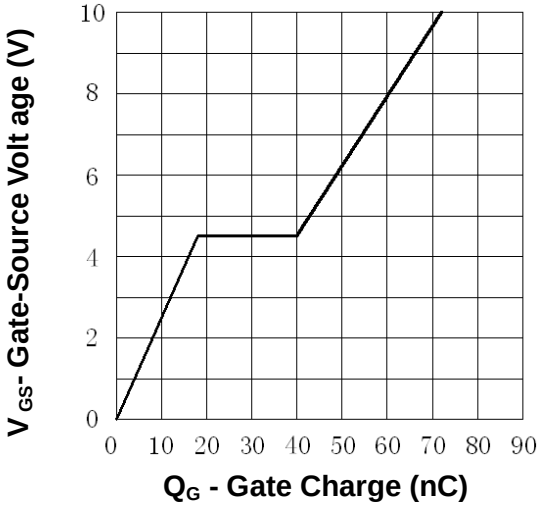
Source-Drain Diode Forward



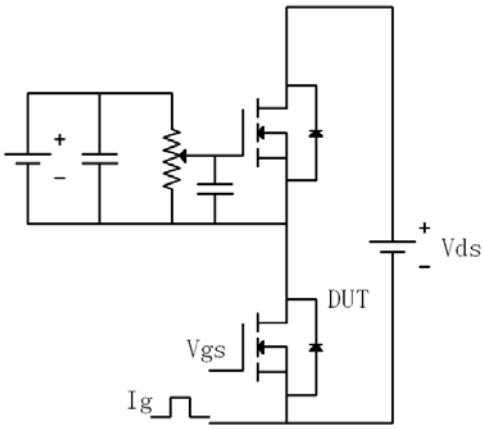
Capacitance

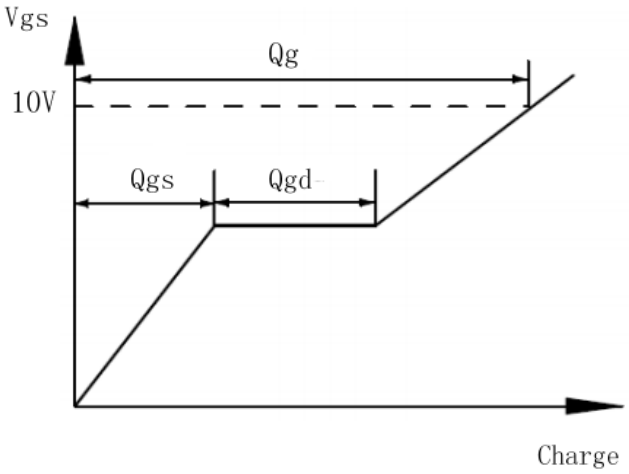


Gate Charge

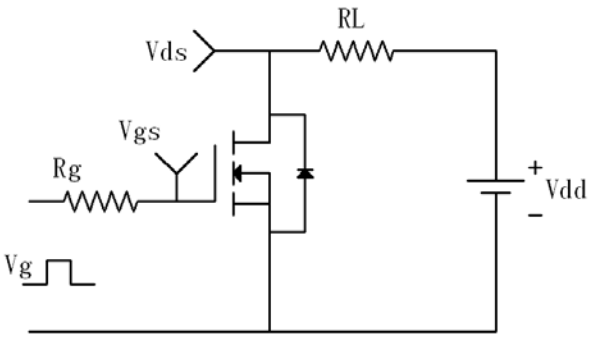


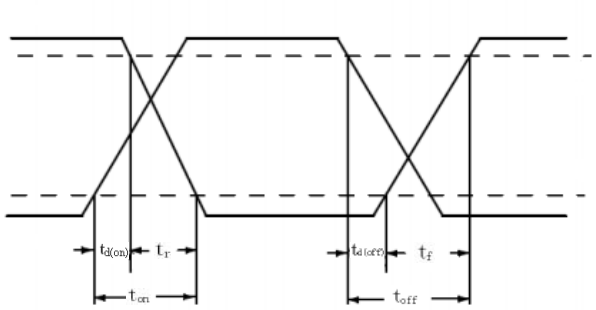
Gate Charge Test Circuit and Waveforms



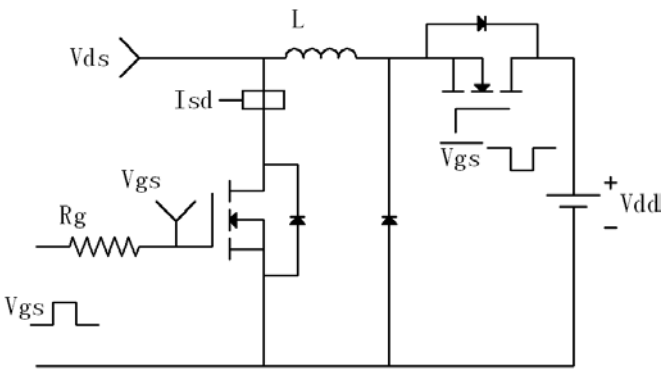


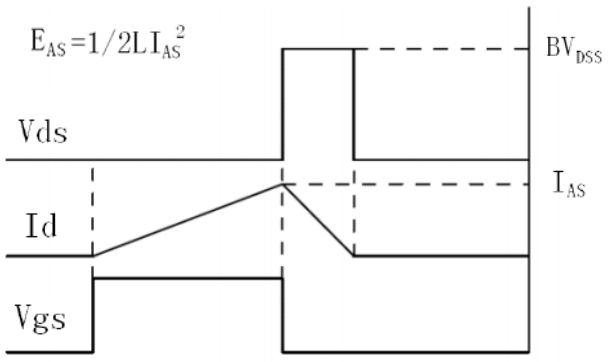
Switching Time Test Circuit & Waveforms





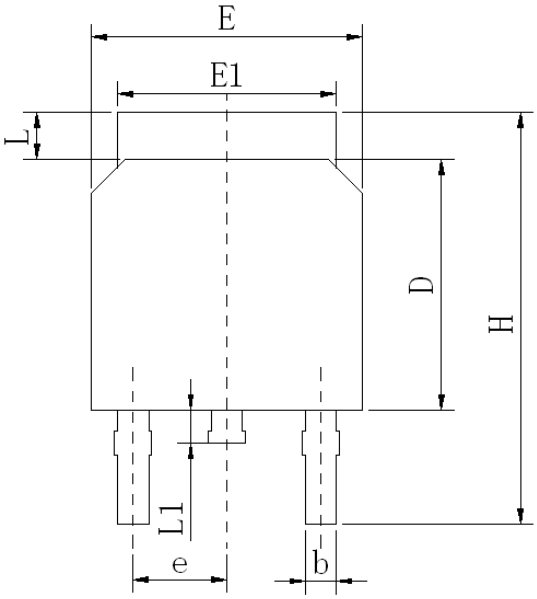
Avalanche Test Circuit& Waveforms

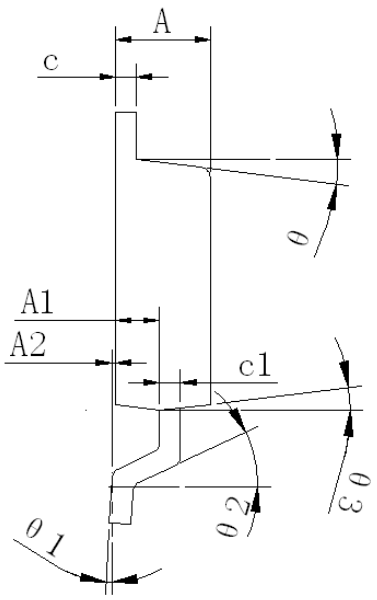


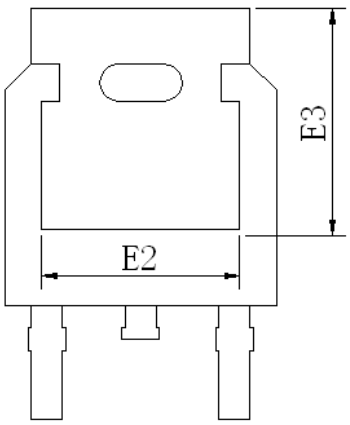


Package Outline

TO252







UNIT:mm

SYMBOL	MIN	NOM	MAX
A	2.25	2.30	2.35
A1	1.02	1.07	1.12
A2	0.05	0.1	0.15
b	0.71	0.76	0.81
c	0.46	0.51	0.56
c1	0.46	0.51	0.56
D	6.05	6.10	6.15
E	6.55	6.60	6.65
E1	5.23	5.33	5.43
E2	4.73	4.83	4.93
E3	5.30	5.40	5.50
e	2.286 BSC		
H	9.82	10.02	10.22
L	0.96	1.01	1.06
L1	0.7	0.8	0.9
Θ	5°	7°	9°
Θ1	1°	3°	5°
Θ2	23°	25°	27°
Θ3	5°	7°	9°