

Main Product Characteristics:

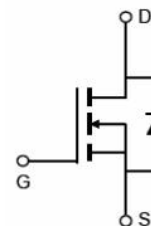
V_{DSS}	150V
$R_{DS(on)}$	4.8m Ω (typ.)
I_D	240A



TO-220
SMS015N07A1



TO-263
SMS015N07D1



Schematic Diagram

Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature



Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

Symbol	Parameter	Max.	Units
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}^{\text{①}}$	240	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}^{\text{①}}$	185	
I_{DM}	Pulsed Drain Current ^②	720	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation ^③	272	W
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ $L=0.5\text{mH}$	1024	mJ
I_{AS}	Avalanche Current	64	A
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Resistance

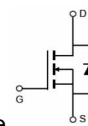
Symbol	Characteristics	Typ.	Max.	Units
R _{θJC}	Junction-to-case ③	—	0.46	°C/W
R _{θJA}	Junction-to-ambient ④	—	62	

Electrical Characteristics @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source breakdown voltage	150	—	—	V	V _{GS} = 0V, I _D = 250μA
R _{DS(on)}	Static Drain-to-Source on-resistance	—	4.8	5.8	mΩ	V _{GS} =10V, I _D =40A
V _{GS(th)}	Gate threshold voltage	1	—	2.5	V	V _{DS} =V _{GS} , I _D =250uA
I _{DSS}	Drain-to-Source leakage current T _J =25°C	—	—	1	μA	V _{DS} =140V, V _{GS} =0V
I _{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V _{GS} =20V, V _{DS} =0V
		—	—	-100		V _{GS} =-20V, V _{DS} =0V
Q _g	Total gate charge	—	66	—	nC	V _{GS} =10V, V _{DS} =75V, I _D =70A
Q _{gs}	Gate-to-Source charge	—	21	—		
Q _{gd}	Gate-to-Drain("Miller") charge	—	20	—		
t _{d(on)}	Turn-on delay time	—	18	—	ns	V _{GS} =10V V _{DS} =75V R _G =3Ω R _L =1.07Ω
t _r	Rise time	—	21	—		
t _{d(off)}	Turn-Off delay time	—	36	—		
t _f	Fall time	—	10	—		
C _{iss}	Input capacitance	—	4196	—	pF	V _{GS} =0V V _{DS} =25V f=1MHz
C _{oss}	Output capacitance	—	2875	—		
C _{riss}	Reverse transfer capacitance	—	210	—		

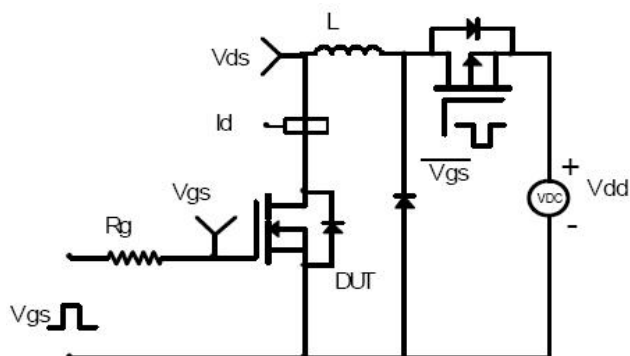
Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	240	A	MOSFET symbol showing the integral reverse p-n junction diode.
I _{SM}	Pulsed Source Current (Body Diode)	—	—	720	A	
V _{SD}	Diode Forward Voltage	—	—	1.2	V	I _S =20A, V _{GS} =0V
t _{rr}	Reverse Recovery Time	—	101	—	ns	I _F = 20A, di/dt=500A/μs
Q _{rr}	Reverse Recovery Charge	—	1240	—	nC	

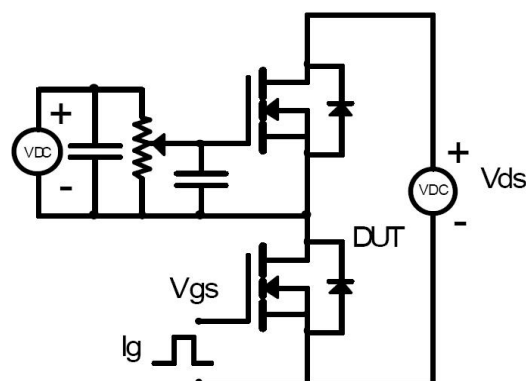


Test Circuits and Waveforms

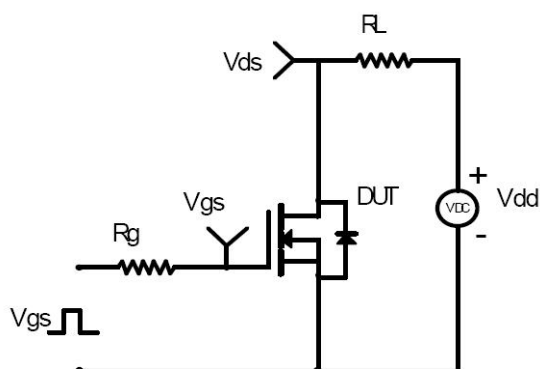
EAS Test Circuit:



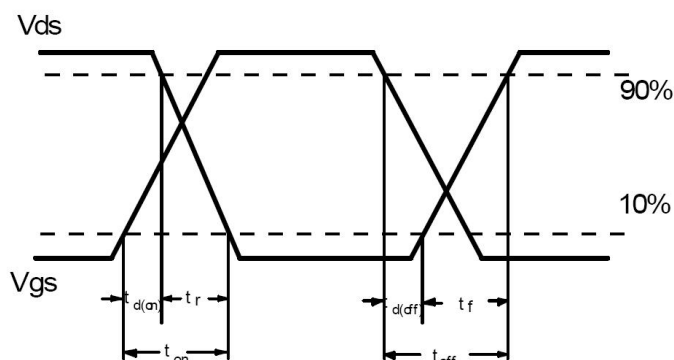
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching Waveforms:



Notes:

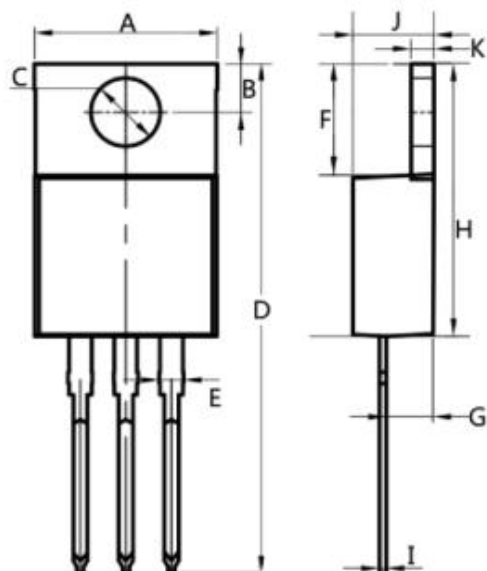
- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation P_D is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

Mechanical Data:

Product ID	Package
SMS015N07A1	TO-220
SMS015N07D1	TO-263

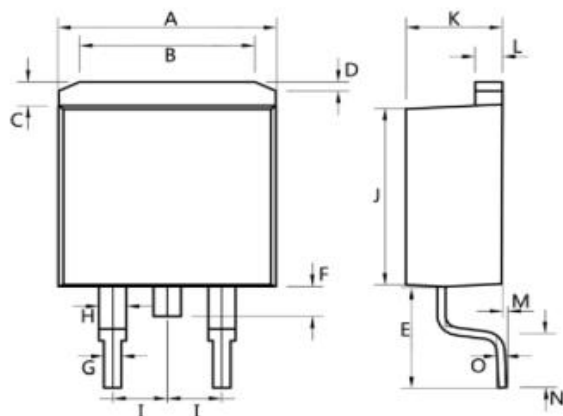
Unit:mm

TO-220AB



Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

TO-263



Dim.	Min.	Max.
A	10.0	10.5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	Typ 2.54	
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45
All Dimensions in millimeter		

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