General Description

The SJD500R65 uses advanced SIC technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 18V. This device is suitable for use as a wide variety of applications.

Features

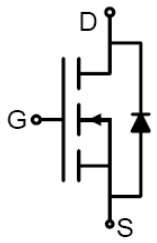
- Wide Bandgap SiC MOSFET Technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed Switching
- Low Reverse Recovery
- Easy to Parallel and Simple to Drive

Application

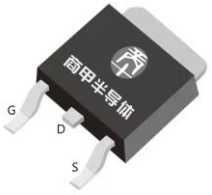
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Solar Inverters

Key Performance Parametes

Parameter	Value	Unit
V_{DS}	650	V
$R_{DS(ON)_TYP}$	501	mΩ
I_D	7	A
Q_G	7.8	nC



Schematic Diagram



TO-252 top view

RoHS

Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJD500R65	SJD500R65	TO-252	Tape	\	\	2500 Pcs

Table 1. Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage (V_{GS}=0V)	650	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	-10/+18	V
I_D	Drain Current-Continuous(T_C=25℃)	7	A
	Drain Current-Continuous(T_C=100℃)	4.4	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	11	A
P_D	Maximum Power Dissipation(T_C=25℃)	28	W
	Maximum Power Dissipation(T_C=100℃)	11	W
E_{AS}	Avalanche energy (Note 2)	16	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		4.4	℃/W

Table 3. Electrical Characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=1mA	650			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V, V_{GS}=0V			10	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=18V, V_{DS}=0V			100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=1mA	2.5		4.4	V
g_{FS}	Forward Transconductance	V_{DS}=10V, I_D=2A		0.6		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=18V, I_D=2A		501	626	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=500V,V_{GS}=0V, f=1MHz		150		pF
C_{oss}	Output Capacitance			12		pF
C_{rss}	Reverse Transfer Capacitance			2		pF
Rg	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		2.3		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=18V, V_{DS}=400V, L=120uH, R_{GEN}=2.5Ω		5.3		nS
t_r	Turn-on Rise Time			5.3		nS
$t_{d(off)}$	Turn-Off Delay Time			7.5		nS
t_f	Turn-Off Fall Time			11.4		nS
Q_g	Total Gate Charge	V_{GS}=18V, V_{DS}=400V, I_D=2A		7.8		nC
Q_{gs}	Gate-Source Charge			1.4		nC
Q_{gd}	Gate-Drain Charge			5.8		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				7	A
V_{SD}	Forward on Voltage (Note 2)	V_{GS}=-4V, I_S=1A		3.5		V
t_{rr}	Reverse Recovery Time	I_F=2A, dI/dt=1000A/μs		4		ns
Q_{rr}	Reverse Recovery Charge	I_F=2A, dI/dt=1000A/μs		3.8		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
Notes 2.E_{AS} condition: T_J=25℃,V_{DD}=60V,V_G=10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

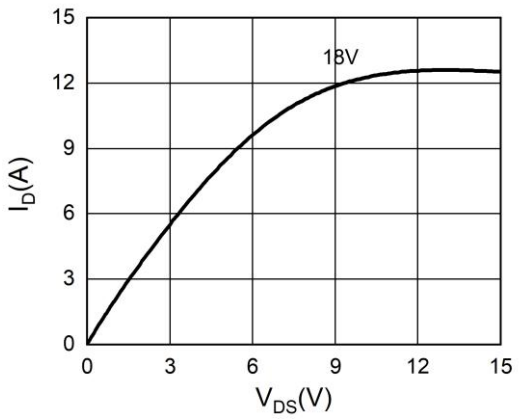


Figure 2. Transfer Characteristics

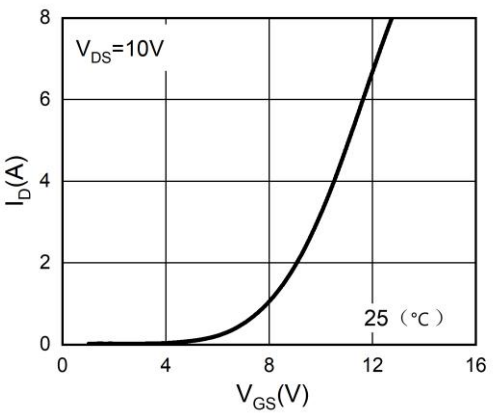


Figure 3. Power Dissipation

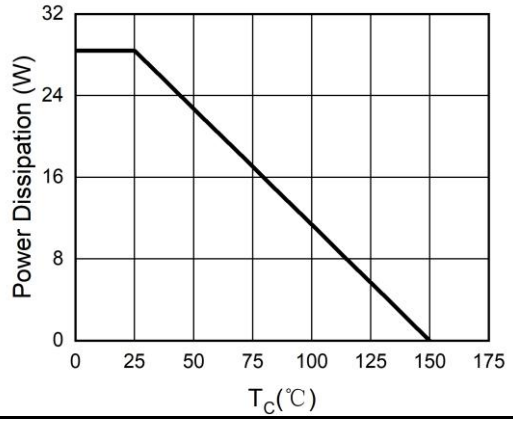


Figure 4. Drain Current

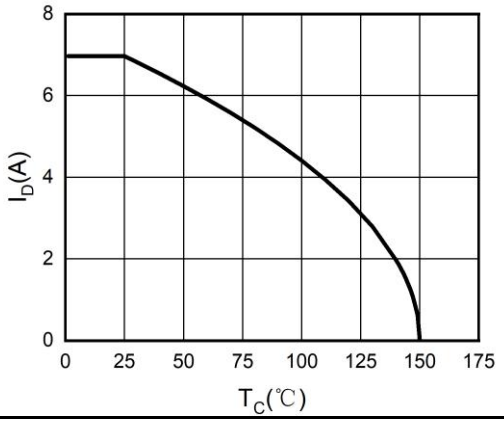


Figure 5. BV_{DSS} vs Junction Temperature

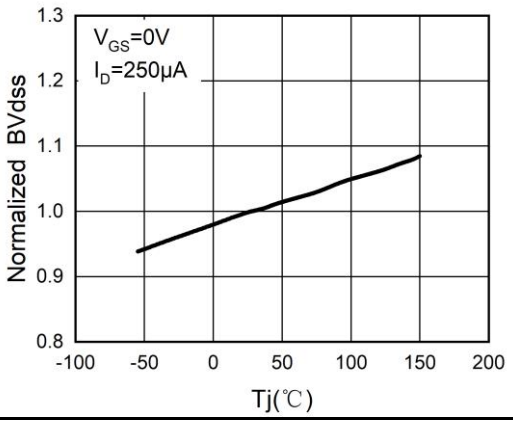
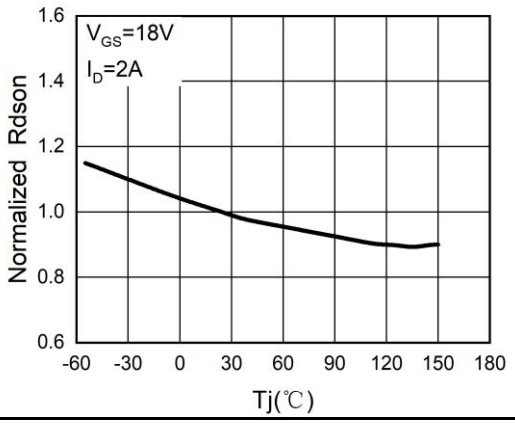


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



Typical Electrical And Thermal Characteristics (Curves)

Figure 7. Gate Charge Waveforms

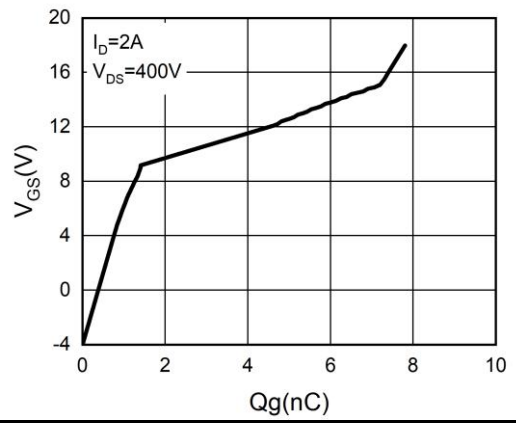


Figure 8. Capacitance

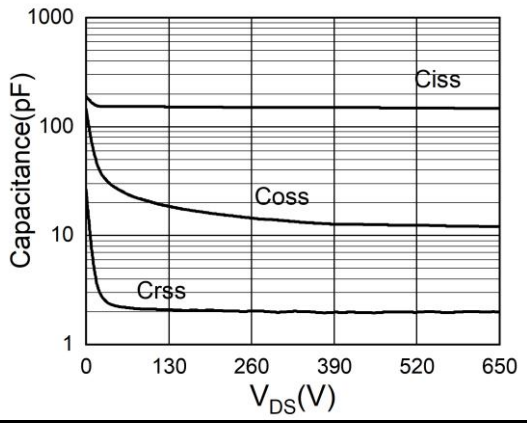


Figure 9. Body-Diode Characteristics

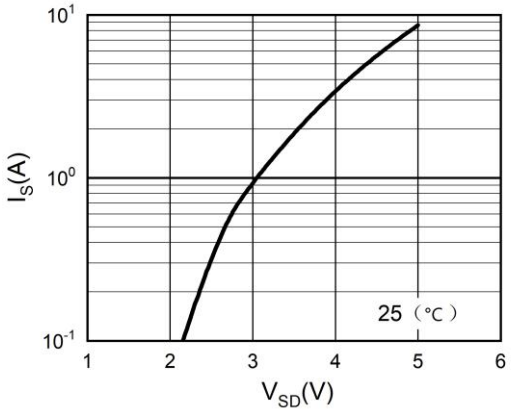
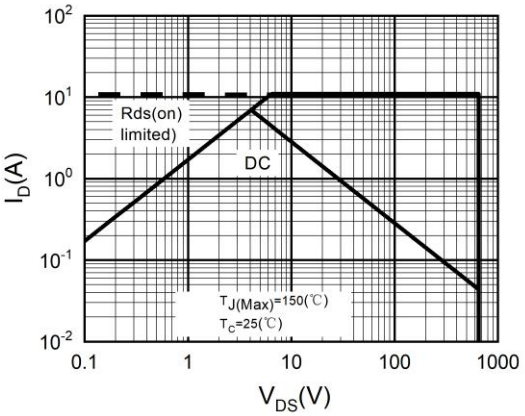
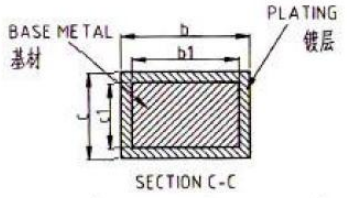


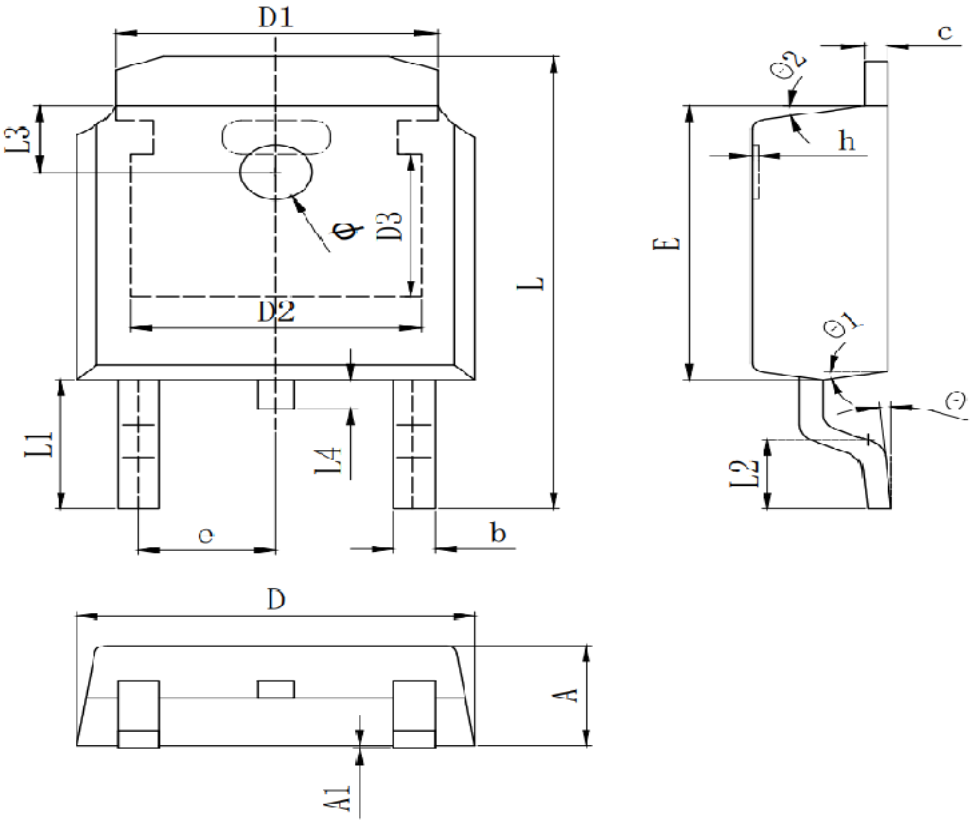
Figure 10. Maximum Safe Operating Area





NOTES
1.ALL DIMENSIONS REFER TO JEDEC STANDARD TO-252 AA.
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

L2		0.51BSC	
L3	0.90	-	1.25
L4	0.60	0.80	1.00
L5	1.70	1.80	1.90
θ	0°	-	8°
θ1	5°	7°	9°
θ2	5°	7°	9°
K		0.40REF	



Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c(电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	4.826 REF		
D3	3.166 REF		
E	6.000	6.100	6.200
e	2.286 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.888 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.600	0.800	1.000
Φ	1.100	1.200	1.300
θ	0°		8°
θ1	9° TYP		
θ2	9° TYP		

Attention

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