



650V N-Channel SiC Power MOSFET

General Description

The SJD345R65 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

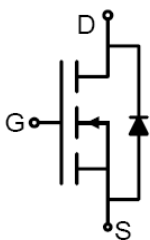
- Wide Bandgap SiC MOSFET Technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed Switching
- Low Reverse Recovery
- Easy to Parallel and Simple to Drive

Application

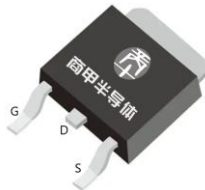
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Solar Inverters

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	650	V
$R_{DS(ON_TYP)}$	337	mΩ
I_D	10.7	A
Q_G	14	nC



Schematic Diagram



TO-252 top view



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJD345R65	SJD345R65	TO-252	Tape	\	\	2500 Pcs

Table 1. Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ 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($T_C=25^\circ\text{C}$)	10.7	A
	Drain Current-Continuous($T_C=100^\circ\text{C}$)	6.7	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	42.8	A
P_D	Maximum Power Dissipation($T_C=25^\circ\text{C}$)	43	W
	Maximum Power Dissipation($T_C=100^\circ\text{C}$)	17	W
E_{AS}	Avalanche energy (Note 2)	30	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ\text{C}$

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		2.9	$^\circ\text{C/W}$



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Table 3. Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =500μA	650			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =650V, V _{GS} =0V			1	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 =250μA	3		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		337	421	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz		220		pF
C _{oss}	Output Capacitance			42		pF
C _{rss}	Reverse Transfer Capacitance			7		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		0.7		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =18V, V _{DS} =500V, R _L =200Ω, R _{GEN} =5Ω		5		nS
t _r	Turn-on Rise Time			9		nS
t _{d(off)}	Turn-Off Delay Time			6		nS
t _f	Turn-Off Fall Time			10		nS
Q _g	Total Gate Charge	V _{GS} =18V, V _{DS} =400V, I _D =2A		14		nC
Q _{gs}	Gate-Source Charge			5		nC
Q _{gd}	Gate-Drain Charge			4		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				10.7	A
V _{SD}	Forward on Voltage (Note 2)	V _{GS} =0V, I _S =2A			1.2	V
t _{rr}	Reverse Recovery Time	I _F =2A, dI/dt=100A/μs		11		ns
Q _{rr}	Reverse Recovery Charge	I _F =2A, dI/dt=100A/μs		31		nC

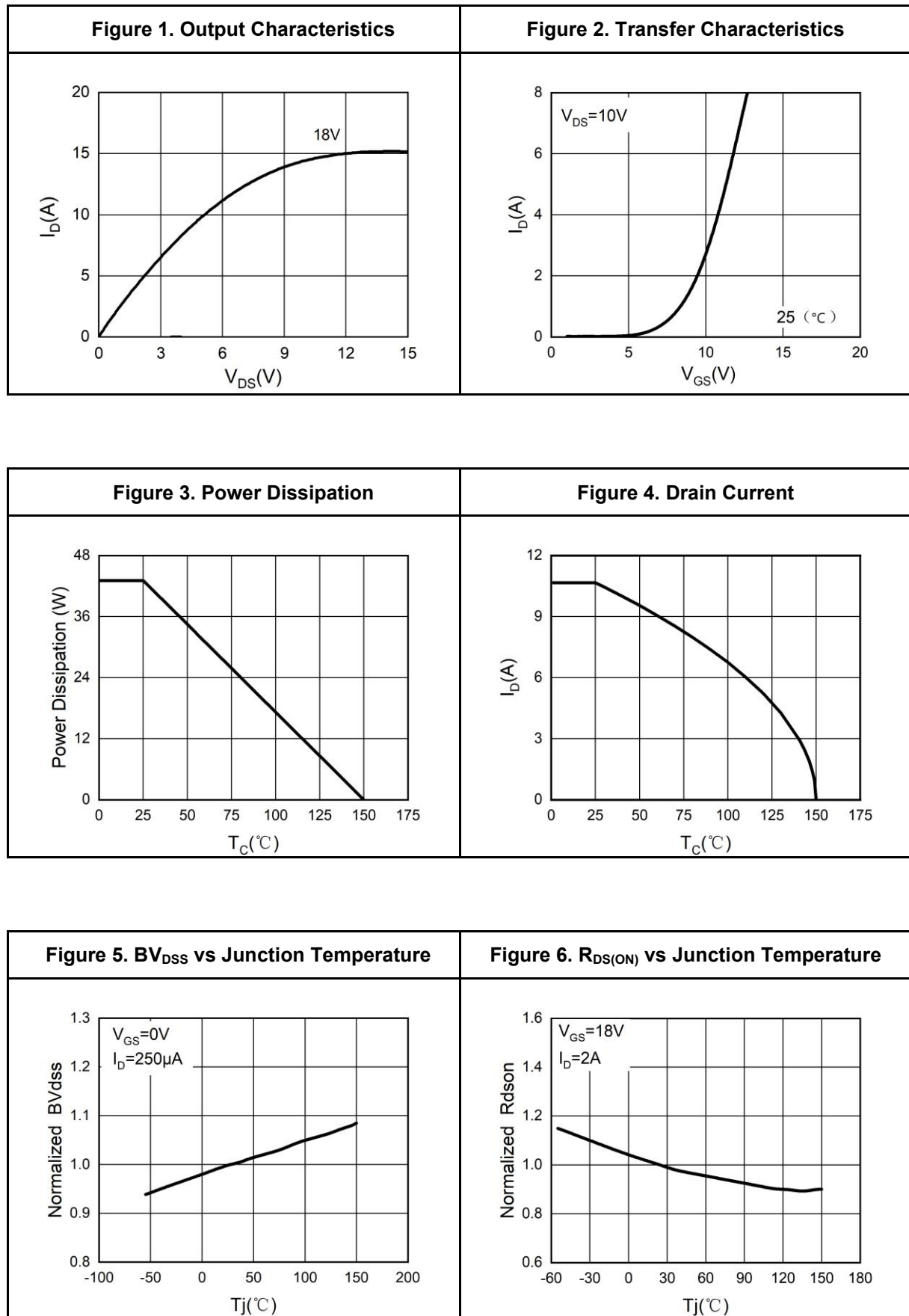
Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=60V, V_G=10V, R_g=25\Omega, L=0.5mH$.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

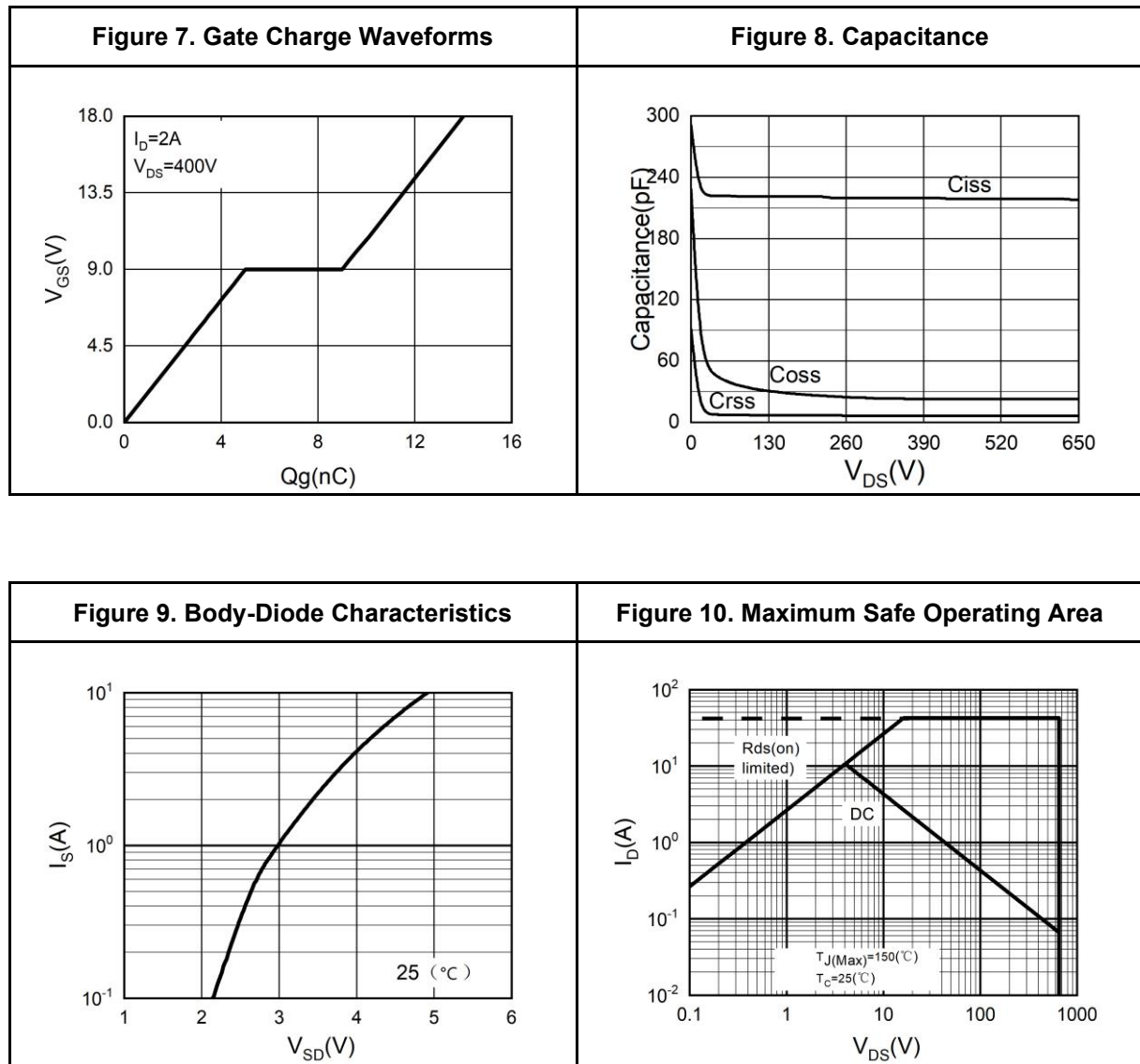


Typical Electrical And Thermal Characteristics (Curves)



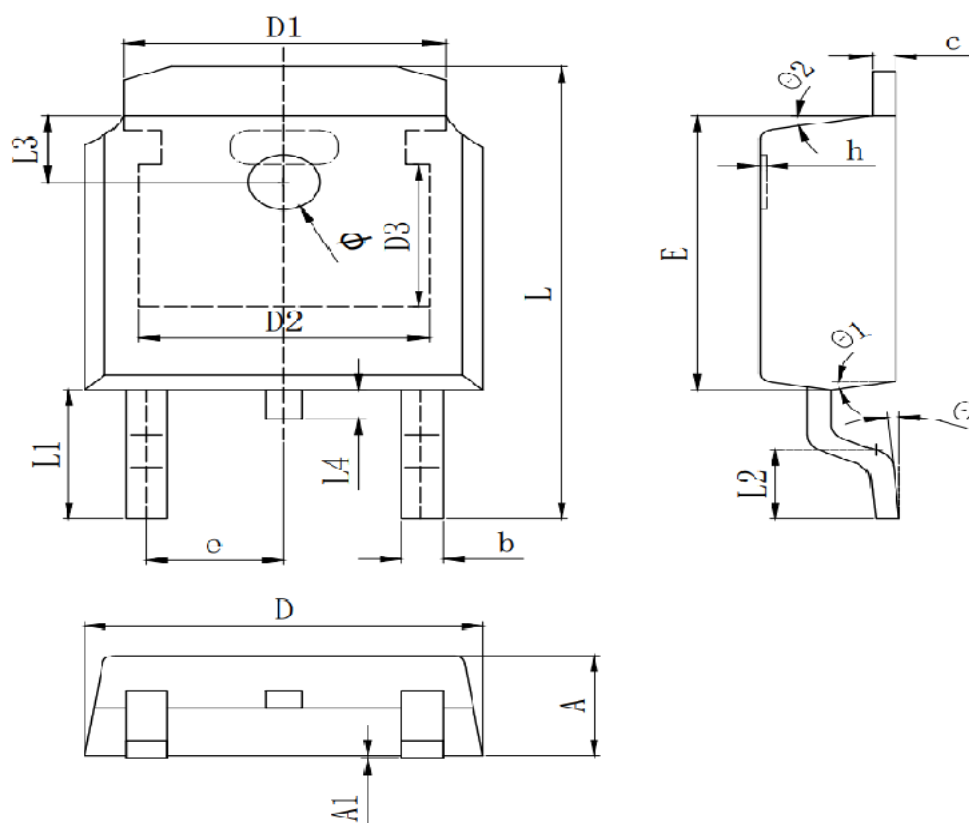


Typical Electrical And Thermal Characteristics (Curves)





L2	0.90	0.518 REF	1.25
L3	0.60	0.80	1.00
L5	1.70	1.80	1.90
θ	0°	-	8°
$\theta 1$	5°	7°	9°
$\theta 2$	5°	7°	9°
K	0.10 REF		



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°
$\theta 1$	9° TYP		
$\theta 2$	9° TYP		



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