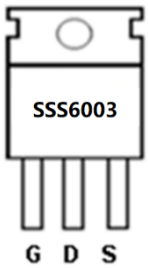
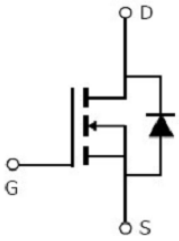
Main Product Characteristics:

V_{DSS}	60V
R_{DS}(on)	2.5mΩ(typ.)
I_D	180A①

TO-220



Marking and Pin Assignment



Schematic Diagram

Features andBenefits:

- High dv/dt and avalanche capabilities
- 100% avalanche tested
- Low input capacitance and gate charge
- Low gate input resistance

Description:

The SSS6003series MOSFETs is a new technology, which combines an innovative technology and advance process.This new technology achieves low Rdson, energy saving, high reliability and uniformity,superior power density and space saving.

Absolute Max Rating:

Symbol	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V①	180	A
I_{DM}	Pulsed Drain Current②	720	
P_D @T_C = 25°C	Power Dissipation③	208	W
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy	609	mJ
I_{AS}	Avalanche Current	28	A
T_J T_{STG}	Operating Junction and Storage TemperatureRange	-55 to +150	°C

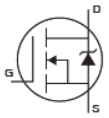
Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case③	—	0.6	℃/W
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s)④	—	60	℃/W

Electrical Characteristics@T_A=25℃unless otherwise specified

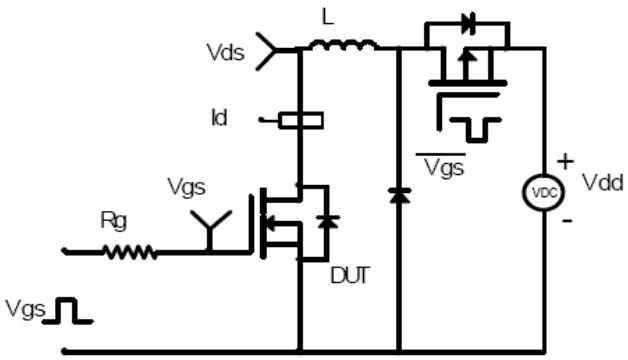
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	60	—	—	V	V_{GS} = 0V, I_D = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	2.5	3	mΩ	V_{GS}=10V,I_D = 50A
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	V_{DS} = V_{GS}, I_D = 250μA
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} =60V,V_{GS}= 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		—	—	-100		V_{GS} = -20V
Q_g	Total gate charge	—	136	—	nC	I_D =50A,
Q_{gs}	Gate-to-Source charge	—	35	—		V_{DS}=30V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	33	—		V_{GS} =10V
$t_{d(on)}$	Turn-on delay time	—	34	—	ns	V_{GS}=10V, V_{DS}=30V, R_{GEN}=25Ω,I_D=50A
t_r	Rise time	—	20	—		
$t_{d(off)}$	Turn-Off delay time	—	100	—		
t_f	Fall time	—	42	—		
C_{iss}	Input capacitance	—	7706	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	653	—		V_{DS} =30V
C_{rss}	Reverse transfercapacitance	—	66	—		f = 1MHz

Source-Drain Ratings and Characteristics

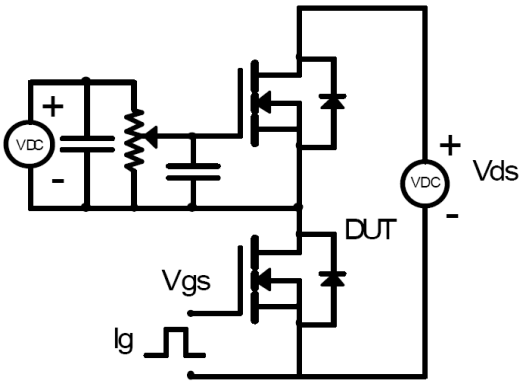
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)①	—	—	50	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	150	A	
V_{SD}	Diode Forward Voltage	—	0.9	1.2	V	I_S=50A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	50	—	ns	T_J = 25°C, I_F =50A, di/dt = 500A/μs
Q_{rr}	Reverse Recovery Charge	—	106	—	nC	

Test circuits and Waveforms

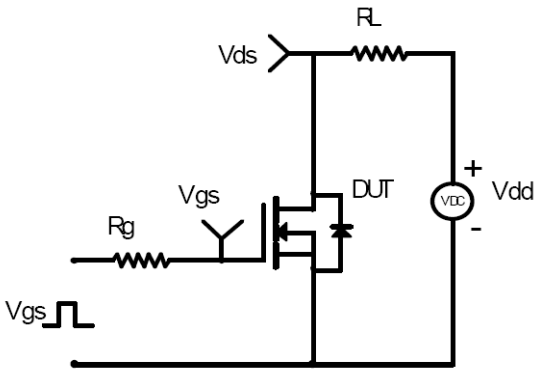
EAS Test Circuit:



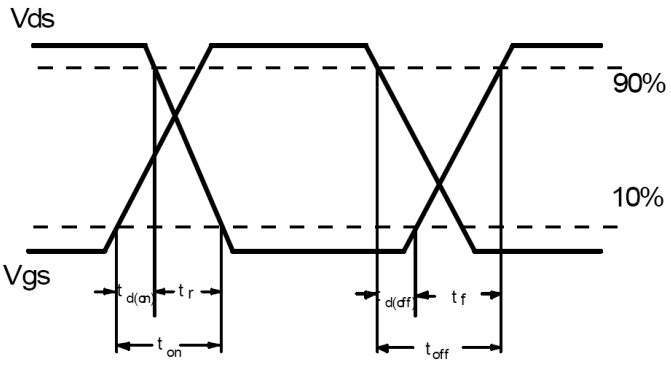
Gate charge test circuit:



Switching Time Test Circuit:



Switching Waveforms:



Notes:

①Calculated continuous current based on maximum allowablejunction temperature.

②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

④The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C

Typical electrical and thermal characteristics

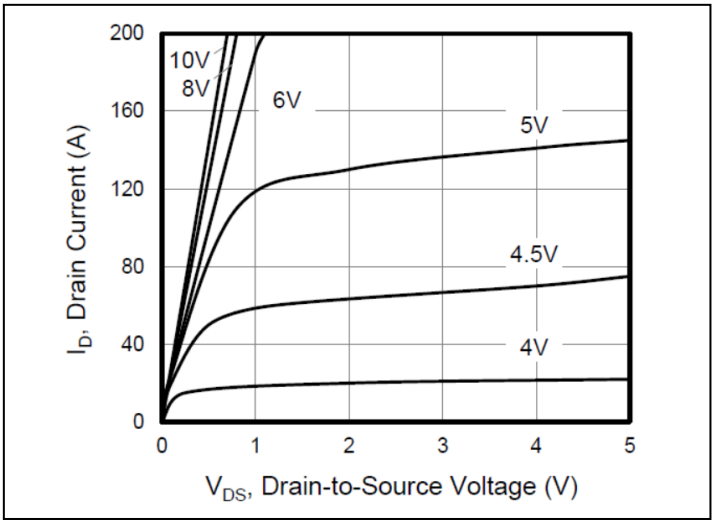


Figure 1: Typical Output Characteristics

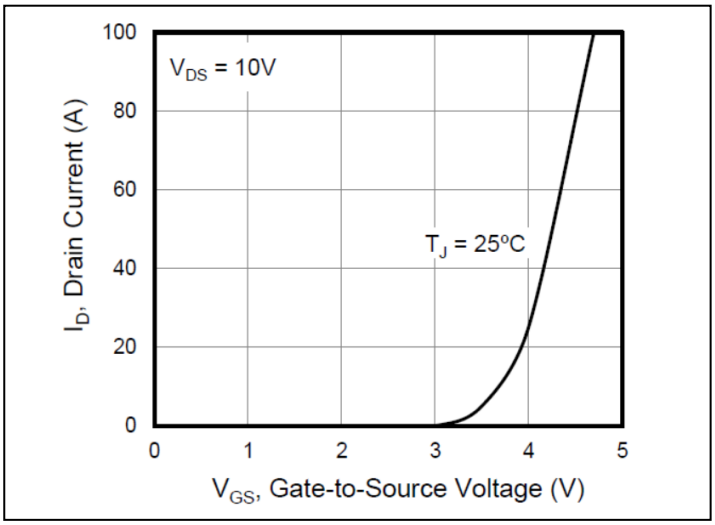


Figure 2:Transfer Characteristics

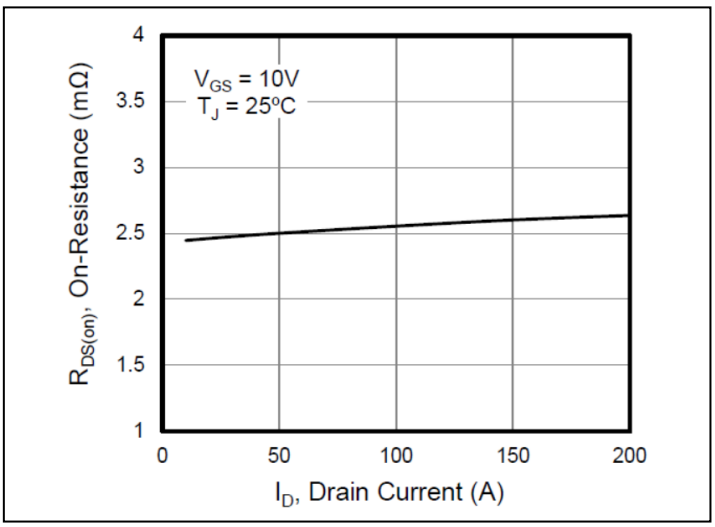


Figure 3: On-Resistance vs. Drain Current

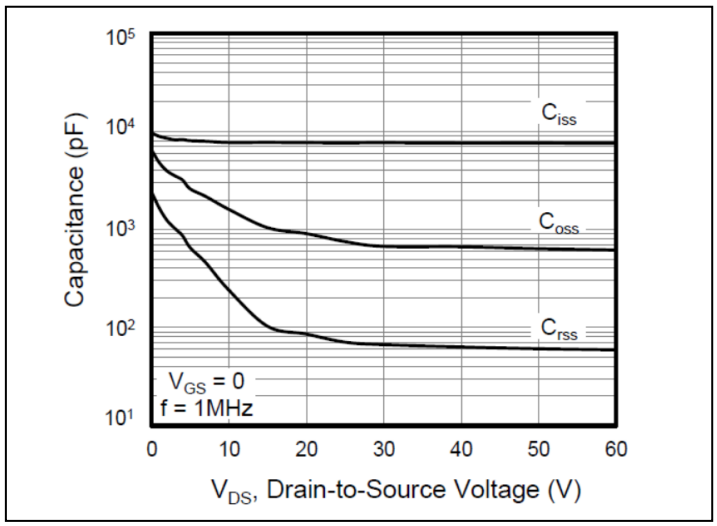


Figure 4: Capacitance

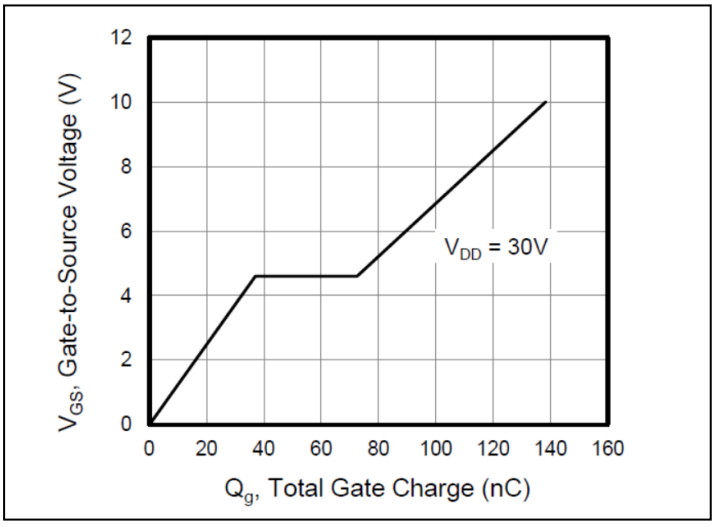


Figure5: Gate Charge

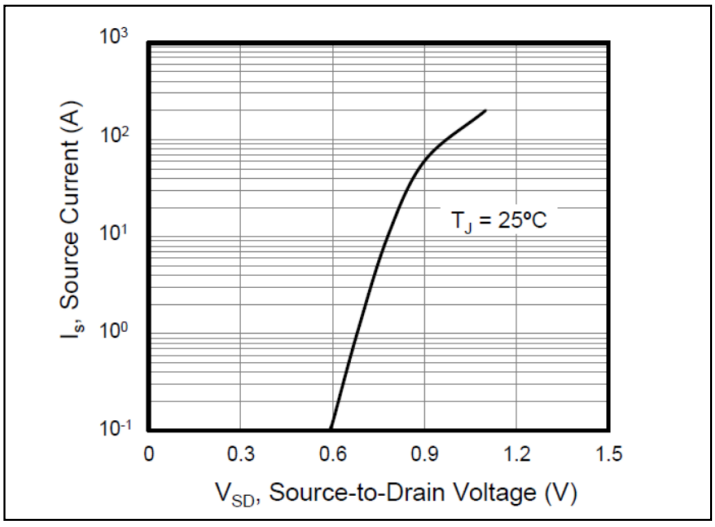


Figure6: Body Diode Forward Voltage

Typical electricaland thermal characteristics

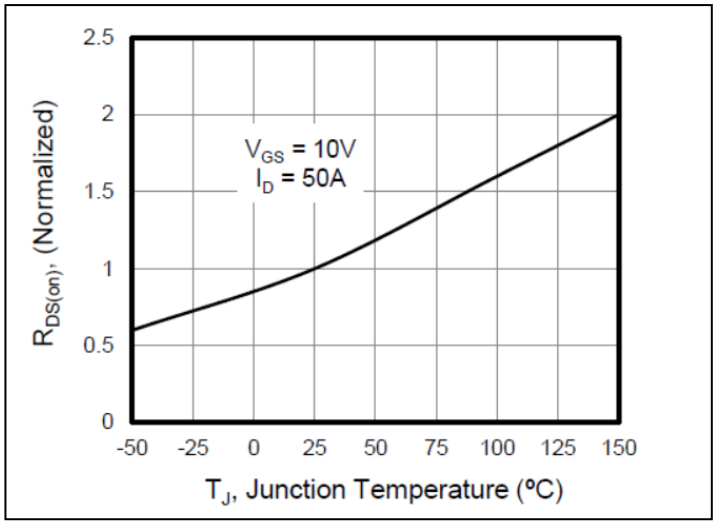


Figure7:On-Resistance vs. Junction Temperature

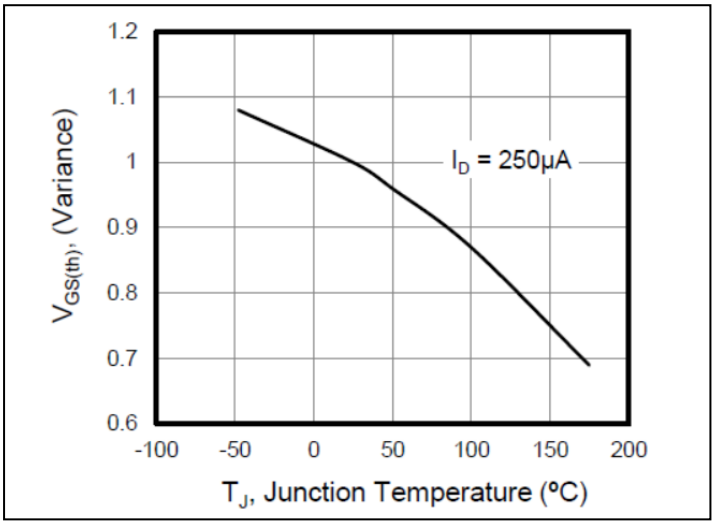


Figure8:Threshold Voltage vs. Junction Temperature

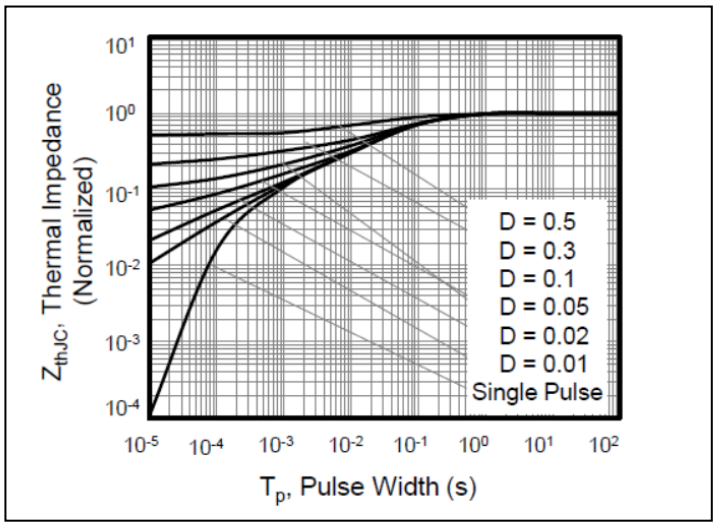


Figure9: Transient Thermal Impedance

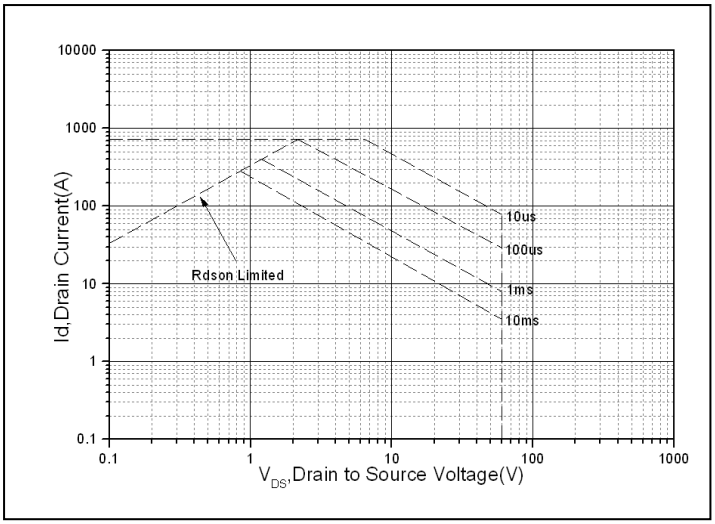
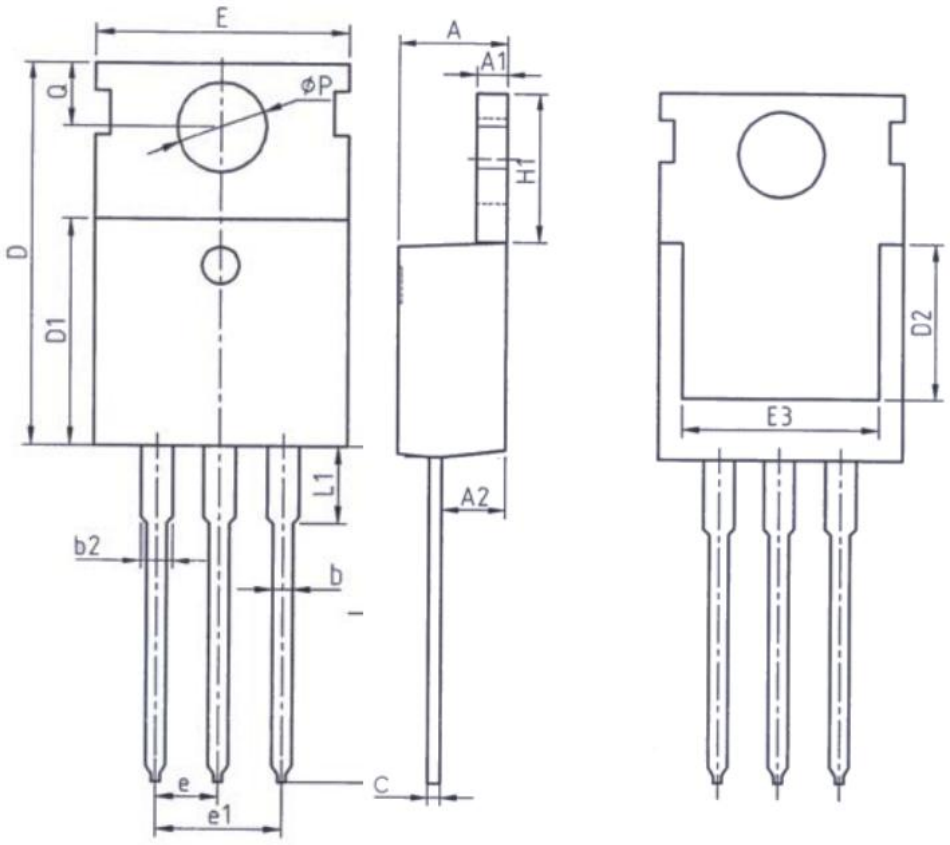


Figure10: Safe Operation Area

Mechanical Data：



Unit: mm		
Symbol	Min.	Max.
A	4.37	4.77
A1	1.25	1.45
A2	2.20	2.60
b	0.70	0.95
b2	1.17	1.47
c	0.40	0.65
D	15.10	16.10
D1	8.80	9.40
D2	5.50	–

Unit: mm		
Symbol	Min.	Max.
E	9.70	10.30
E3	7.00	–
e	2.54BSC	
e1	5.08BSC	
H1	6.25	6.85
L	12.75	13.80
L1	–	3.40
P	3.40	3.80
Q	2.60	3.00

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