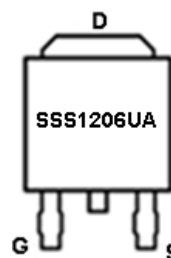
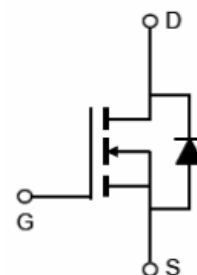


Main Product Characteristics:

V_{DSS}	120V
$R_{DS(on)}$	5m Ω (typ.)
I_D	110A



TO-263


 Marking and pin
Assignment


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 @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V ①	110	A
I_{DM}	Pulsed Drain Current ②	330	
P_D @TC = 25°C	Power Dissipation ③	192	W
V_{DS}	Drain-Source Voltage	120	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.3mH	400	mJ
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

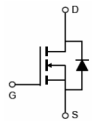
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	0.65	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10\text{s}$) ④	—	62	$^{\circ}\text{C}/\text{W}$

Electrical Characterizes @ $T_A=25^{\circ}\text{C}$ unless otherwise specified

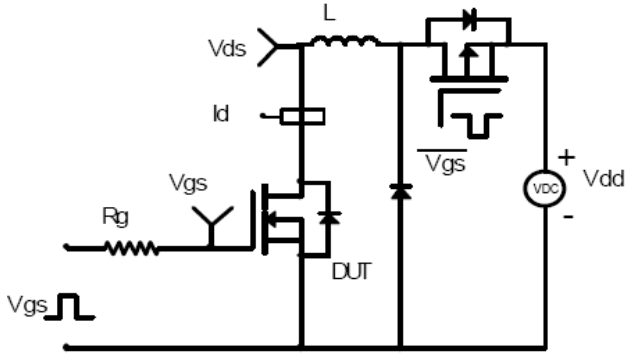
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	120	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	5	6.5	m Ω	$V_{GS}=10\text{V}, I_D = 30\text{A}$
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 120\text{V}, V_{GS} = 0\text{V}$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 20\text{V}$
		—	—	-100		$V_{GS} = -20\text{V}$
Q_g	Total gate charge	—	70	—	nC	$I_D = 25\text{A},$ $V_{DS}=50\text{V},$ $V_{GS} = 10\text{V}$
Q_{gs}	Gate-to-Source charge	—	20	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	16	—		
$t_{d(on)}$	Turn-on delay time	—	30	—	ns	$V_{GS}=10\text{V}, V_{DS}=50\text{V},$ $R_{GEN}=2\Omega$ $I_D = 25\text{A}$
t_r	Rise time	—	33	—		
$t_{d(off)}$	Turn-Off delay time	—	60	—		
t_f	Fall time	—	12	—		
C_{iss}	Input capacitance	—	5800	—	pF	$V_{GS} = 0\text{V}$ $V_{DS} = 50\text{V}$ $f = 100\text{kHz}$
C_{oss}	Output capacitance	—	780	—		
C_{riss}	Reverse transfer capacitance	—	20	—		

Source-Drain Ratings and Characteristics

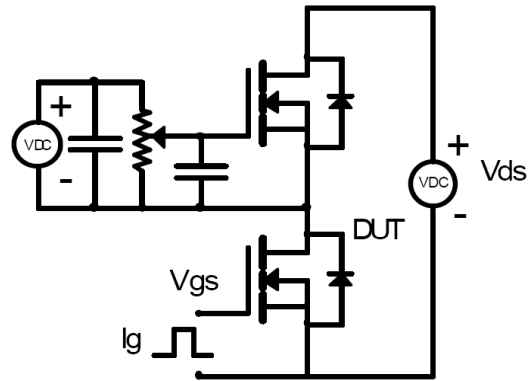
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	110	A	MOSFET symbol showing the integral reverse p-n junction diode. 
V_{SD}	Diode Forward Voltage	—	—	1.3	V	$I_S=30\text{A}, V_{GS}=0\text{V}$
t_{rr}	Reverse Recovery Time	—	85	—	ns	$I_S=25\text{A}, di/dt=100\text{A}/\mu\text{s}$
Q_{rr}	Reverse Recovery Charge	—	240	—	nC	

Test circuits and Waveforms

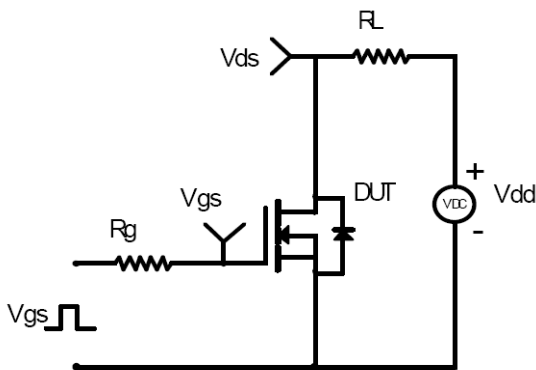
EAS Test Circuit:



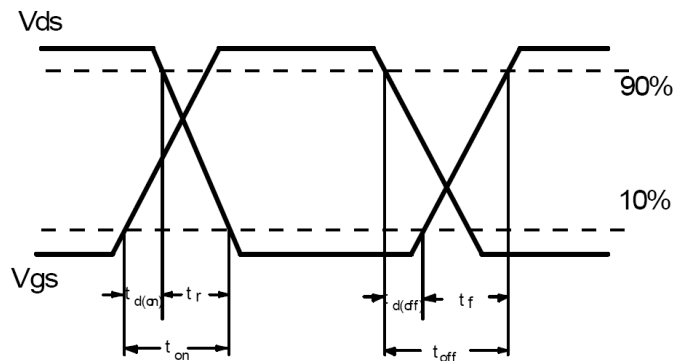
Gate charge test circuit:



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 PD 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 $T_A = 25^\circ\text{C}$

Typical electrical and thermal characteristics

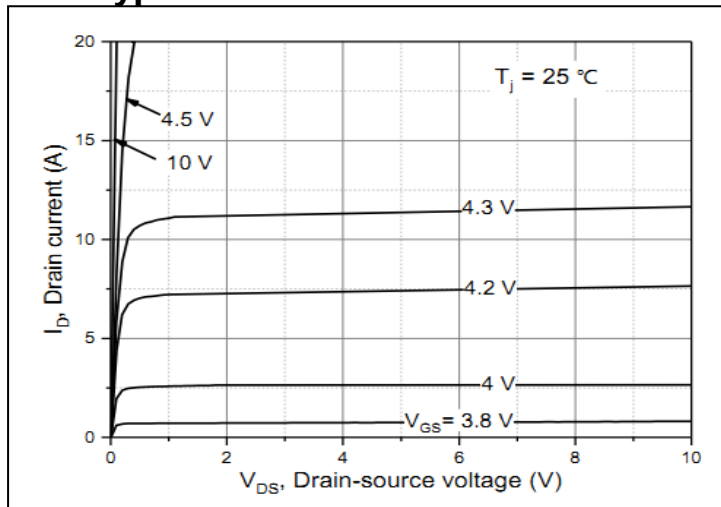


Figure 1: Typical Output Characteristics

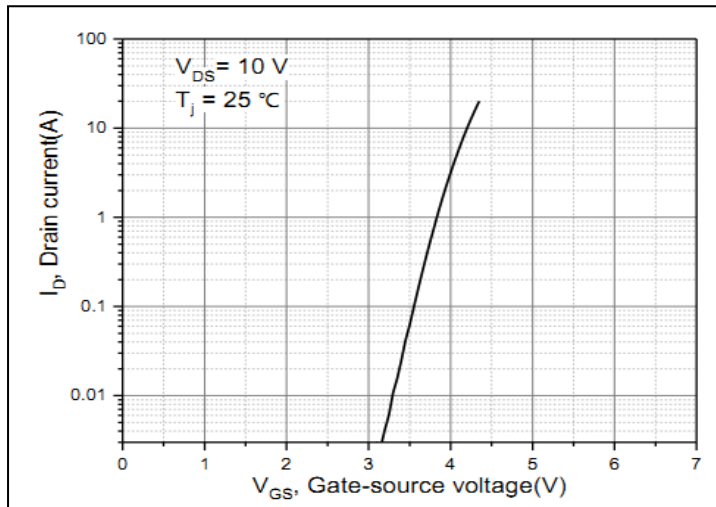


Figure 2: Transfer Characteristics

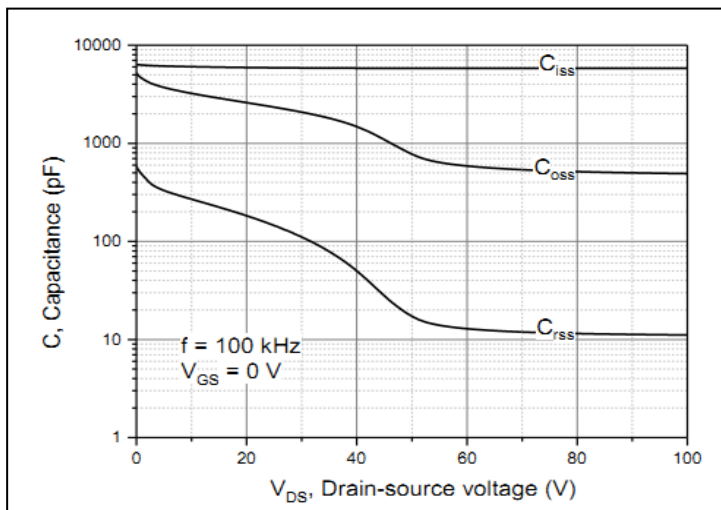


Figure 3: Capacitance vs Vds

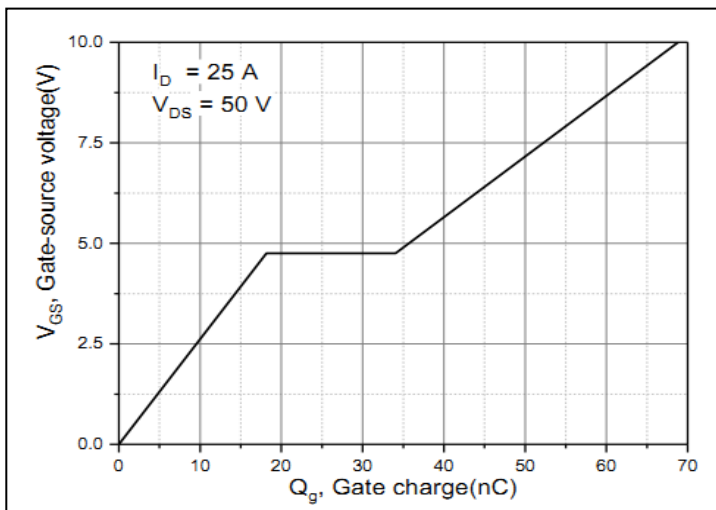


Figure 4: Gate Charge

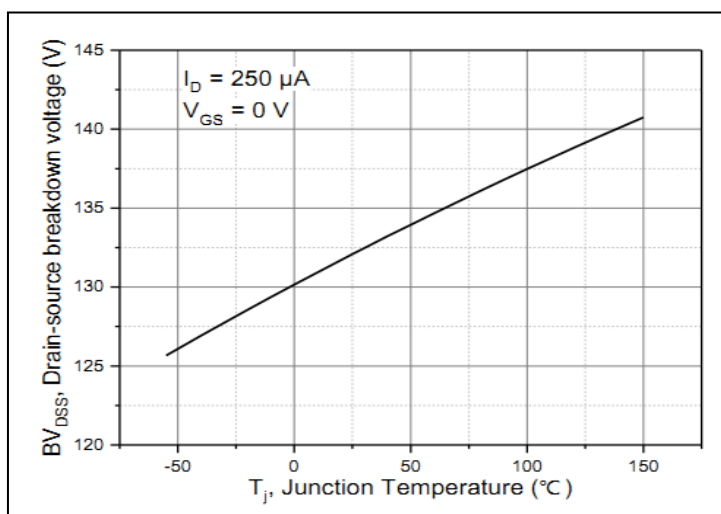


Figure 5: Drain-source Breakdown Voltage

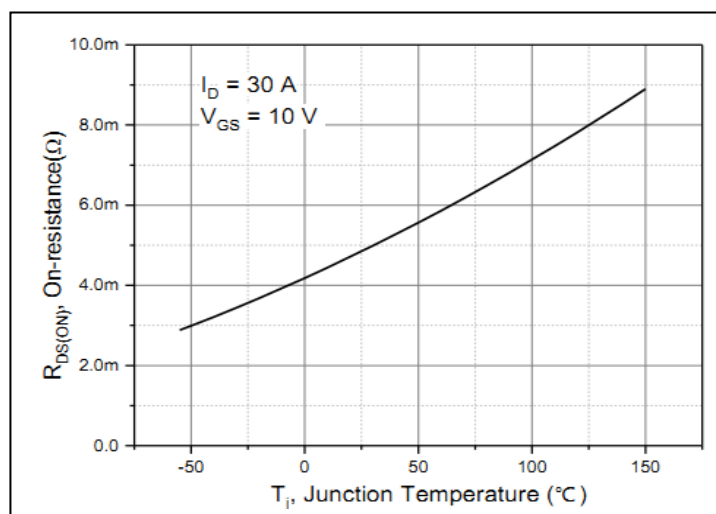


Figure 6: Drain-source on-state Resistance

Typical electrical and thermal characteristics

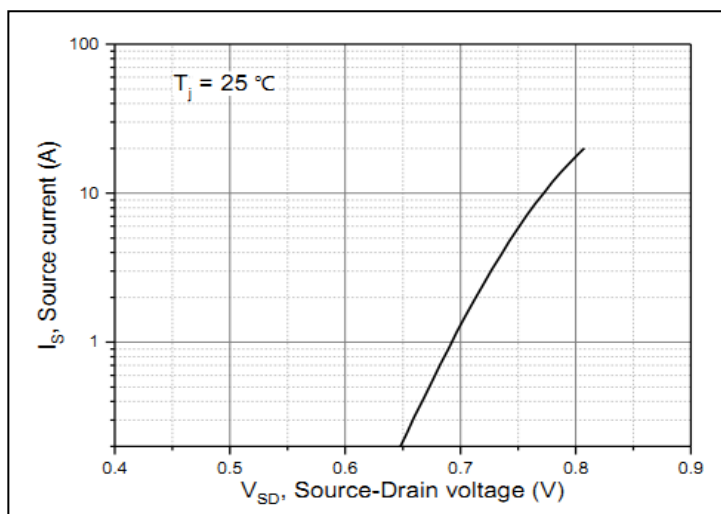


Figure 7: Forward Characteristic Of Body Diode

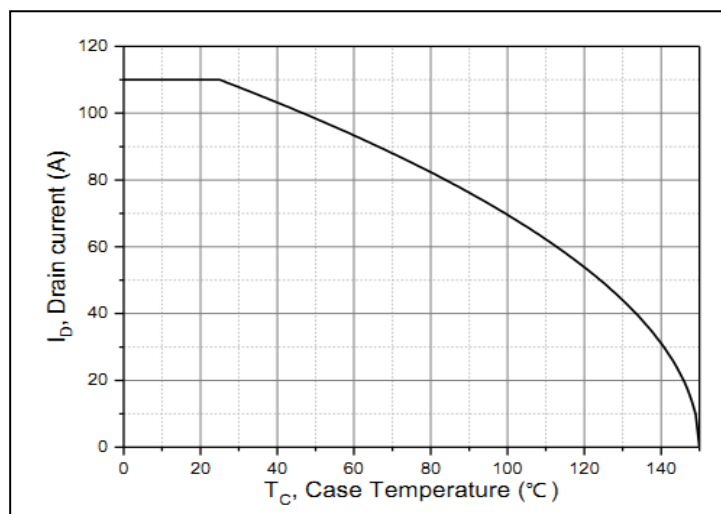


Figure 8: Drain Current

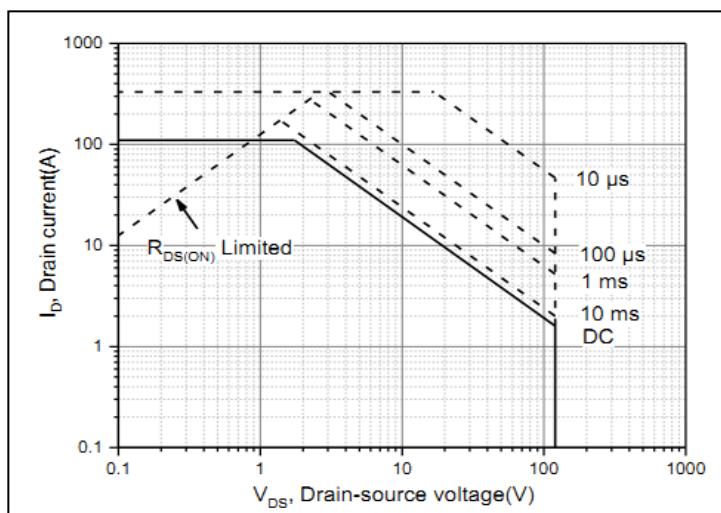
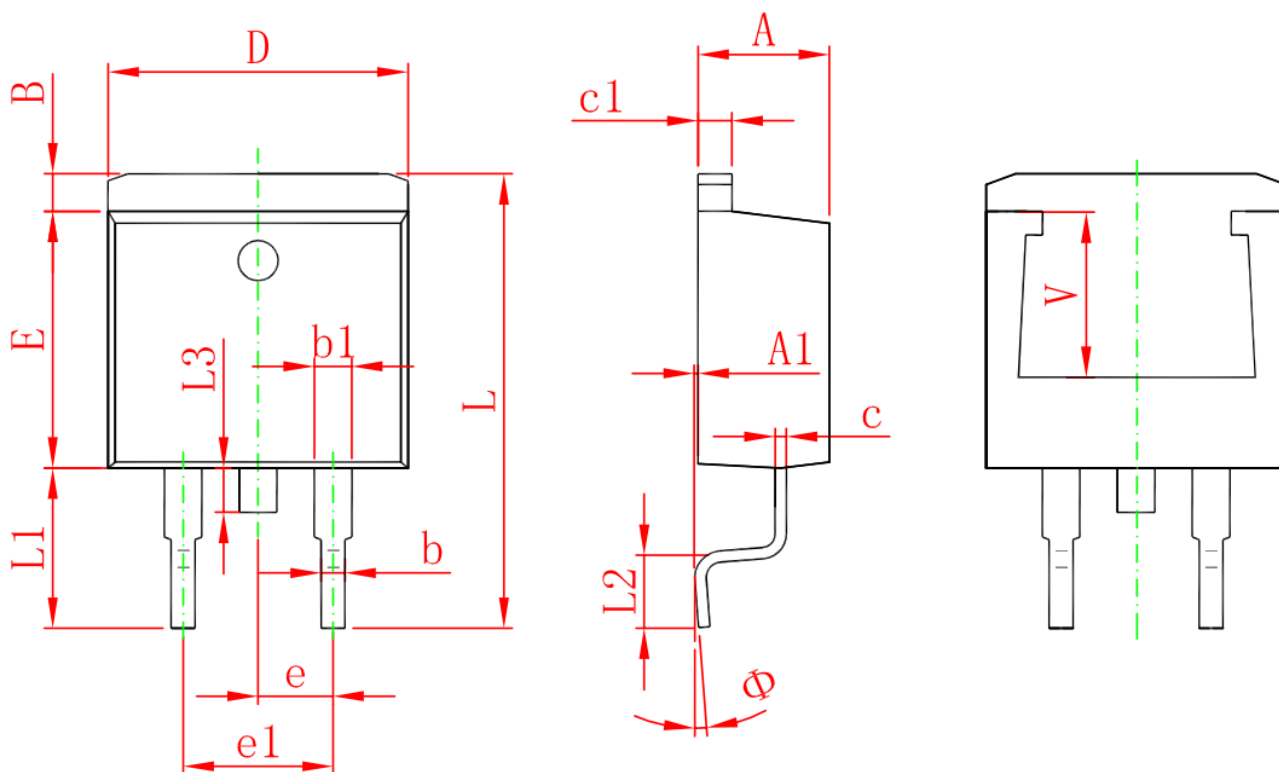


Figure 9: Safe Operation Area

Mechanical Data:


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	

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