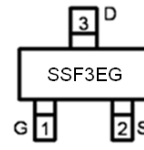
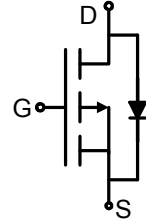


Main Product Characteristics:

V_{DSS}	-12V
$R_{DS(on)}$	33m Ω (typ.)
I_D	-3.5A


SOT-23

Marking and Pin Assignments

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
- AEC-Q101 qualified


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, $V_{GS} @ 10\text{V}^{(1)}$	-3.5	A
I_{DM}	Pulsed Drain Current ⁽²⁾	-14	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation ⁽³⁾	1.25	W
V_{DS}	Drain-Source Voltage	-12	V
V_{GS}	Gate-to-Source Voltage	± 8	V
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

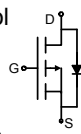
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
R _{θJA}	Junction-to-Ambient ^④	—	100	°C/W

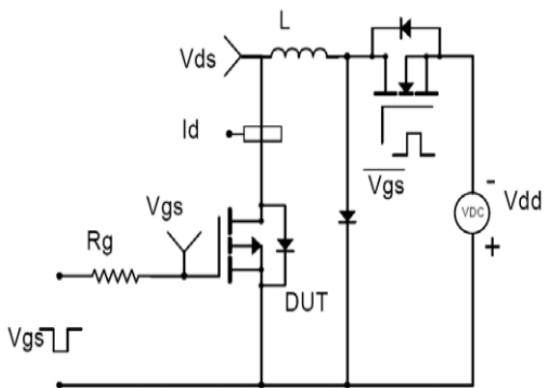
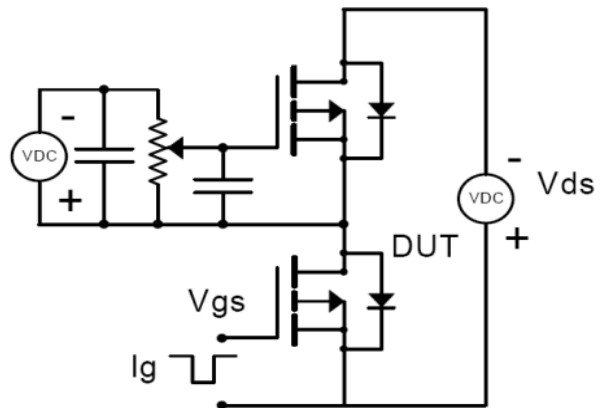
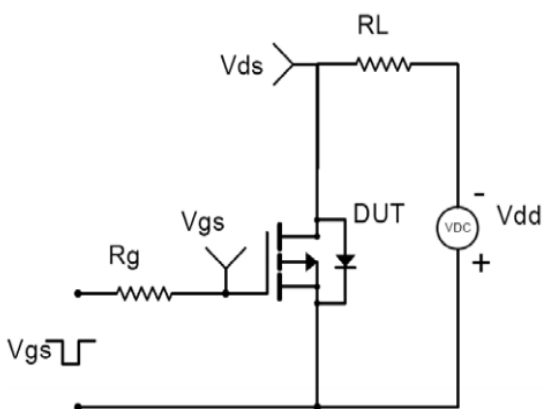
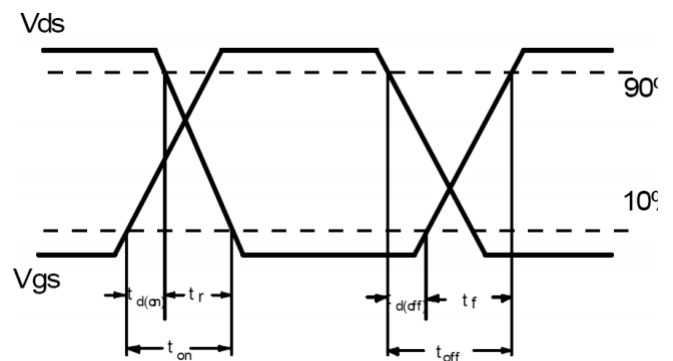
Electrical Characterizes @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source breakdown voltage	-12	—	—	V	V _{GS} = 0V, I _D = -250μA
R _{DS(on)}	Static Drain-to-Source on-resistance	—	33	50	mΩ	V _{GS} = -4.5V, I _D = -4.4A
		—	48	85	mΩ	V _{GS} = -2.5V, I _D = -3.8A
V _{GS(th)}	Gate threshold voltage	-0.4	—	-1	V	V _{DS} = V _{GS} , I _D = -250μA
I _{DSS}	Drain-to-Source leakage current	—	—	-1	μA	V _{DS} = -12V, V _{GS} = 0V
I _{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V _{GS} = 8V
		—	—	-100		V _{GS} = -8V
Q _g	Total gate charge	—	12	—	nC	I _D = -3.5A, V _{DS} = -8V, V _{GS} = -4.5V
Q _{gs}	Gate-to-Source charge	—	1.5	—		
Q _{gd}	Gate-to-Drain("Miller") charge	—	3	—		
t _{d(on)}	Turn-on delay time	—	11.3	—	ns	V _{GS} = -10V, V _{DD} = -10V, R _{GEN} = 3Ω I _D = -1.0A
t _r	Rise time	—	18.1	—		
t _{d(off)}	Turn-Off delay time	—	32.4	—		
t _f	Fall time	—	38.1	—		
C _{iss}	Input capacitance	—	638	—	pF	V _{GS} = 0V V _{DS} = -12V f = 1MHz
C _{oss}	Output capacitance	—	238	—		
C _{rss}	Reverse transfer capacitance	—	221	—		

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	-3.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode)	—	—	-14	A	
V _{SD}	Diode Forward Voltage	—	-0.8	-1.2	V	I _S = -1.7A, V _{GS} = 0V

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

Typical Electrical and Thermal Characteristics

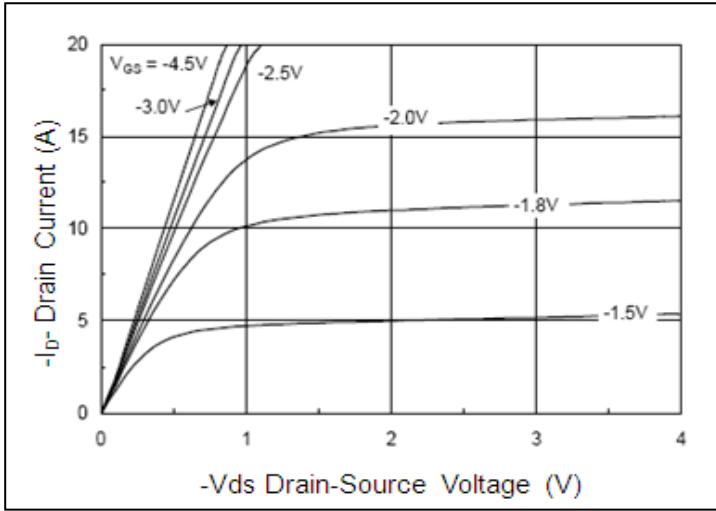


Figure1. Typical Output Characteristics

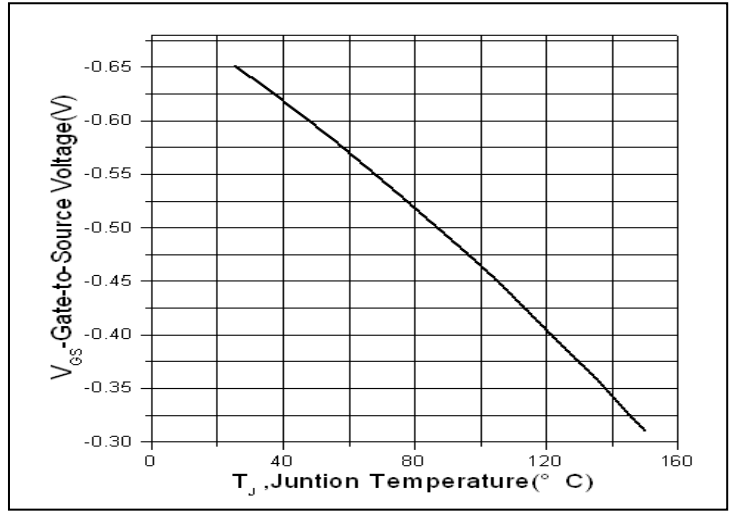


Figure2. V_{th} vs Junction Temperature

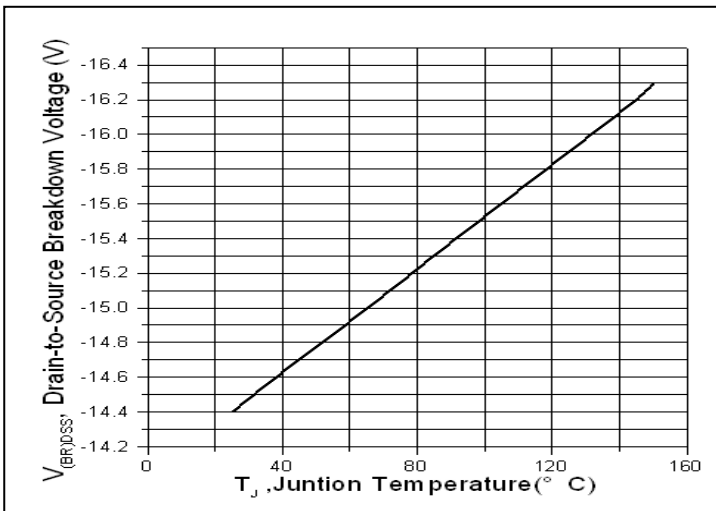


Figure3. Drain-to-Source Breakdown Voltage vs. Junction Temperature

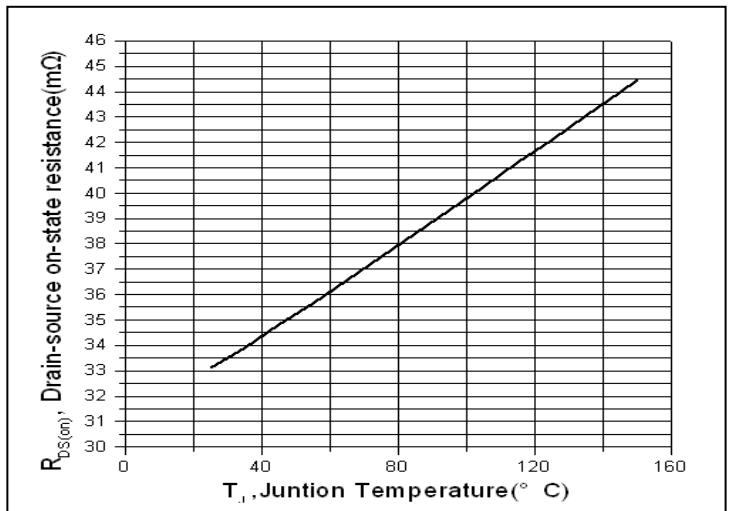


Figure4. $R_{DS(on)}$ vs. Junction Temperature

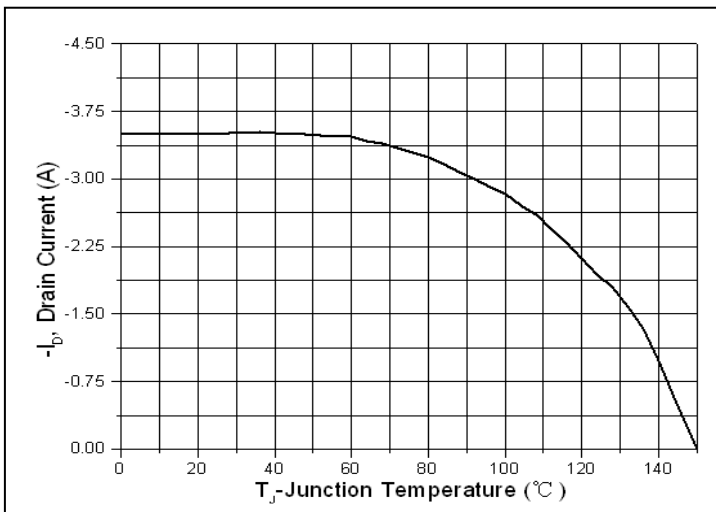


Figure5. Drain Current vs. Junction Temperature

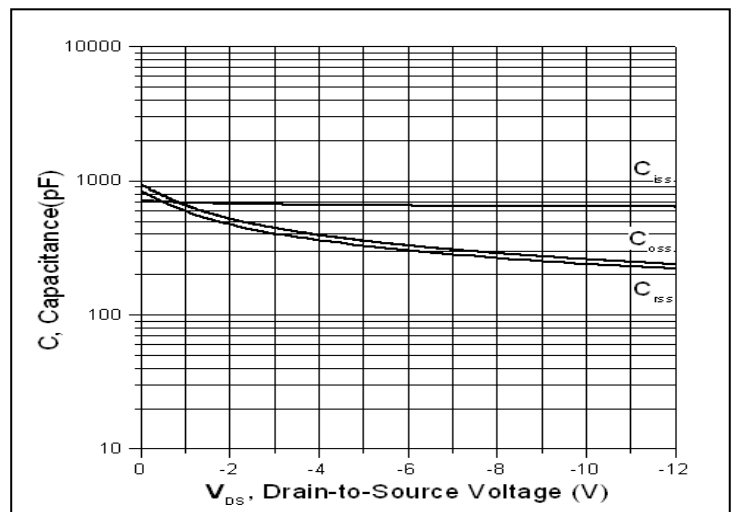


Figure6. Capacitance

Typical Electrical and Thermal Characteristics

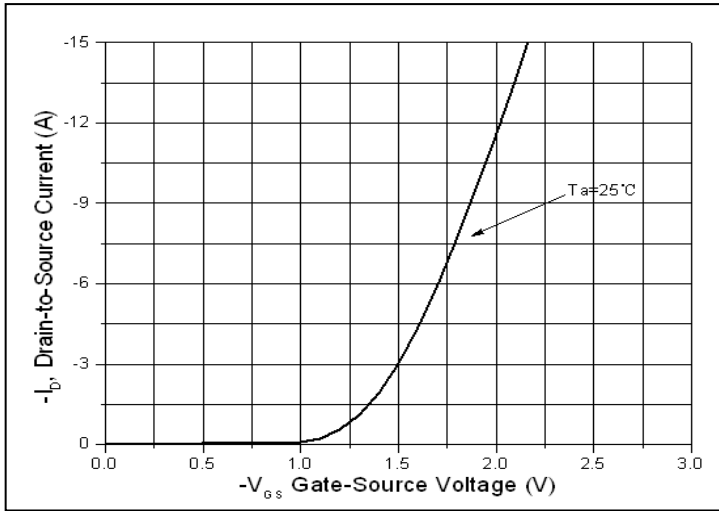


Figure7. Transfer Characteristics

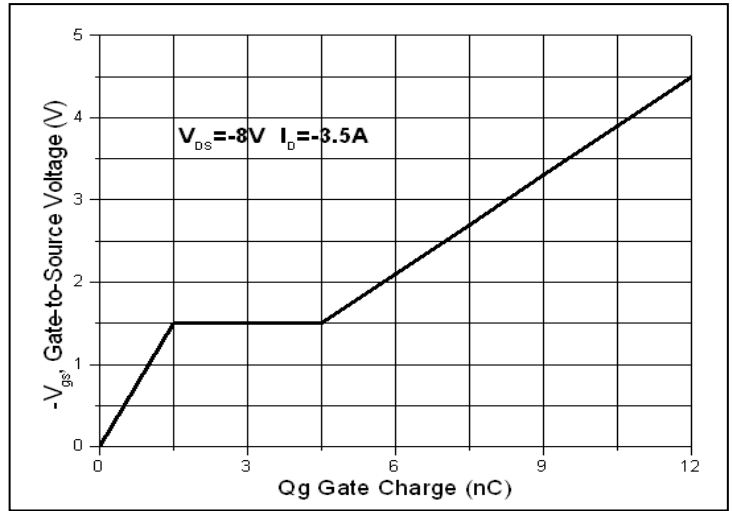


Figure8. Gate source voltage vs. Gate Charge

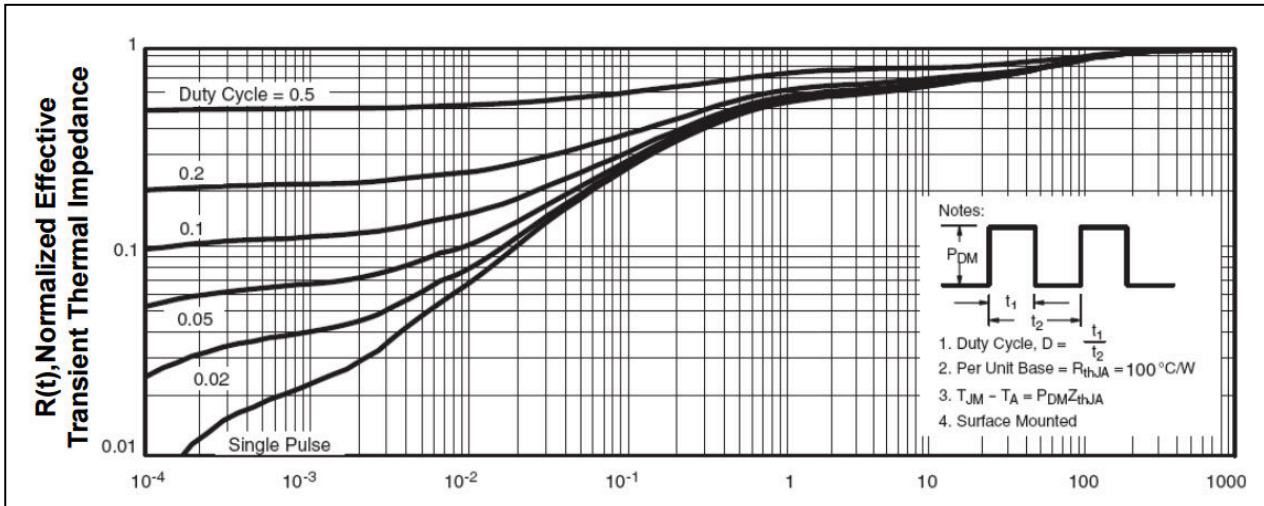
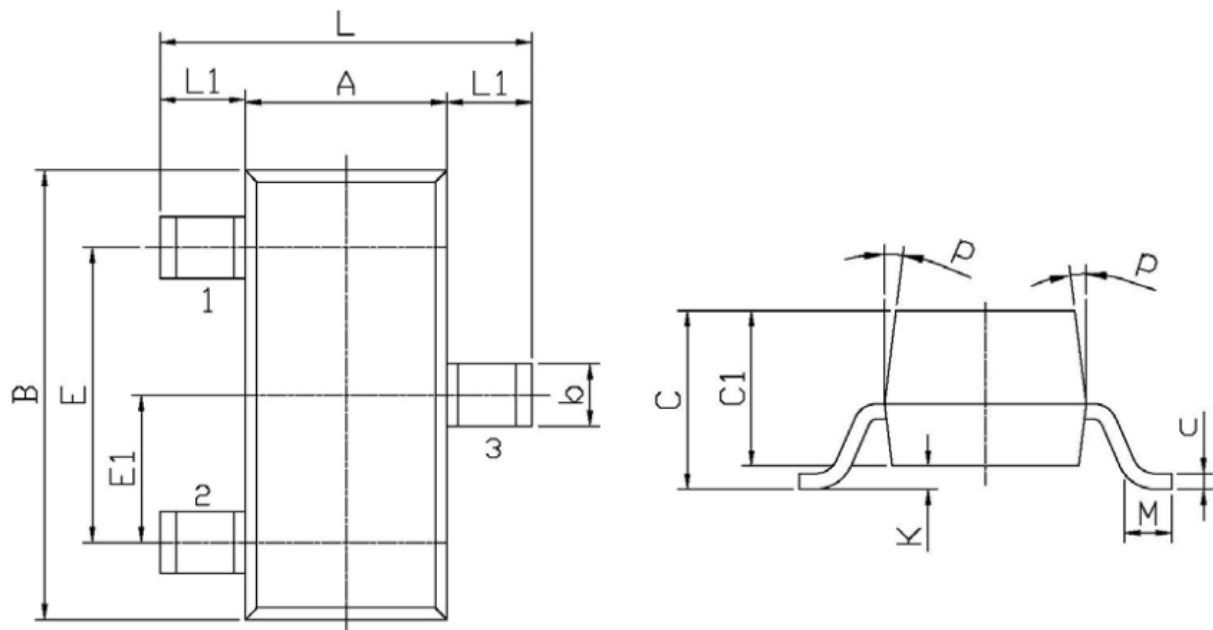


Figure9. Normalized Maximum Transient Thermal Impedance

Mechanical Data:

SOT-23 Package Outline(Unit:mm)



Symbol	Dimensions in Millimeter		Symbol	Dimensions in Millimeter	
	Min	Max		Min	Max
L	2.2	2.7	C	1.30 Max	
L1	0.45	0.65	C1	0.90	1.20
A	1.15	1.50	c	0.05	0.20
B	2.70	3.10	K	0	0.10
E	1.70	2.10	M	0.20 Min	
E1	0.85	1.05	P	7°	
b	0.35	0.55			

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