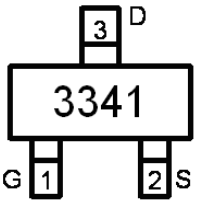
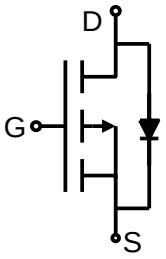
Main Product Characteristics

V_{DSS}	-30V
R_{DS}(on)	44mΩ (typ.)
I_D	-4.2A ①

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℃ 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 @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V ①	-4.2	A
I_D @ T_C = 70°C	Continuous Drain Current, V_{GS} @ 10V ①	-3.5	
I_{DM}	Pulsed Drain Current ②	-30	
P_D @T_C = 25°C	Power Dissipation ③	1.4	W
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-to-Source Voltage	±12	V
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

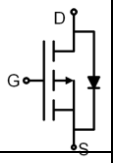
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s) ④	—	90	°C /W

Electrical Characterizes

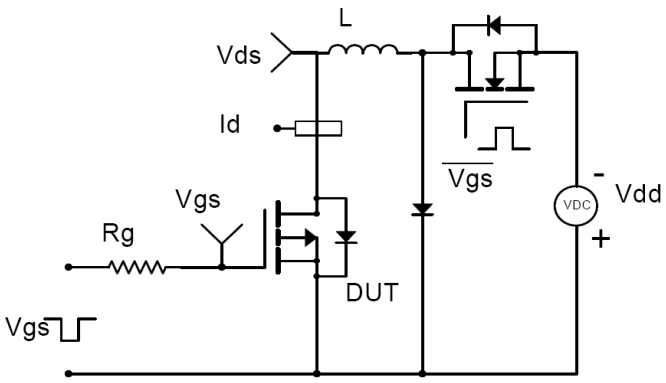
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-30	—	—	V	V_{GS} = 0V, I_D = -250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	44	55	mΩ	V_{GS}=-10V,I_D = -4A
		—	52	75		V_{GS}=-4.5V,I_D = -3A
$V_{GS(th)}$	Gate threshold voltage	-0.6	—	-1.3	V	V_{DS} = V_{GS}, I_D = -250μA
I_{DSS}	Drain-to-Source leakage current	—	—	-1	μA	V_{DS} = -30V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =12V
		—	—	-100		V_{GS} = -12V
Q_g	Total gate charge	—	11	—	nC	I_D = -4A,
Q_{gs}	Gate-to-Source charge	—	2.1	—		V_{DS}=-15V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	2.7	—		V_{GS} = -4.5V
$t_{d(on)}$	Turn-on delay time	—	9.8	—	ns	V_{GS}=-4.5V, V_{DD} =-20V, R_{GEN}=3Ω, R_L=20Ω
t_r	Rise time	—	11	—		
$t_{d(off)}$	Turn-Off delay time	—	25	—		
t_f	Fall time	—	8	—		
C_{iss}	Input capacitance	—	758	—	pF	V_{GS} = 0V,
C_{oss}	Output capacitance	—	64	—		V_{DS} =-20V,
C_{rss}	Reverse transfer capacitance	—	53	—		f = 1MHz

Source-Drain Ratings and Characteristics

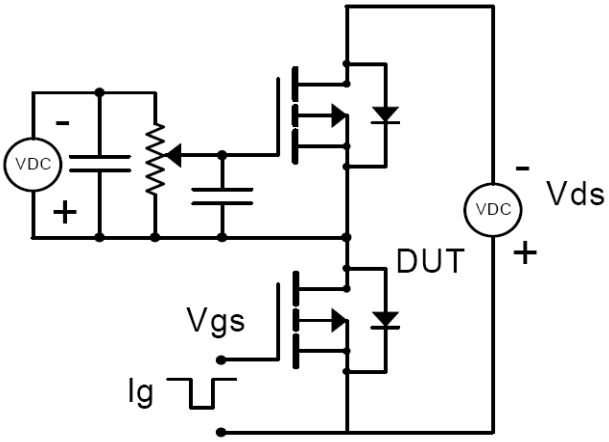
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	-4.2	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-30	A	
V_{SD}	Diode Forward Voltage	—	-0.78	-1.0	V	I_S=-1A, V_{GS}=0V

Test Circuits and Waveforms

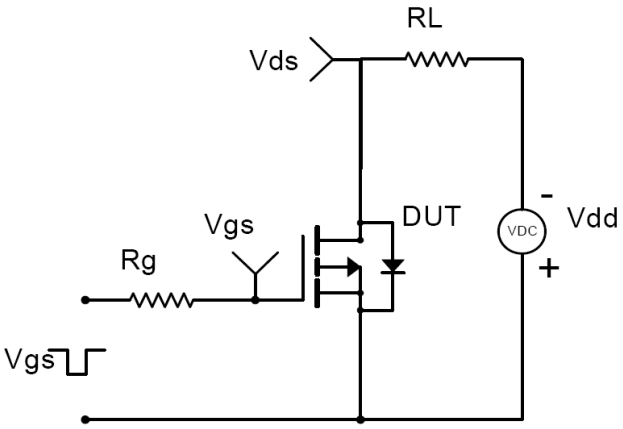
EAS Test Circuit



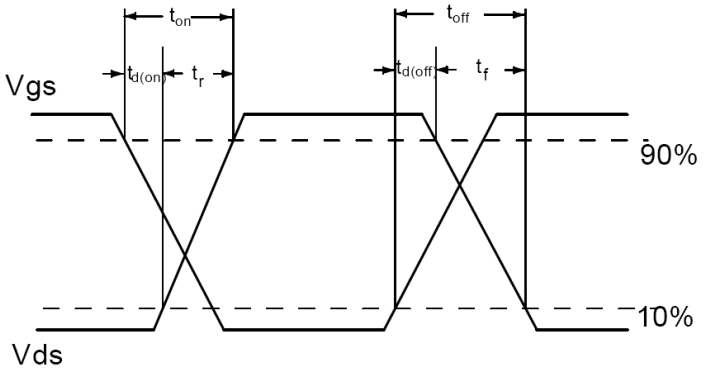
Gate Charge Test Circuit



Switching Time Test Circuit



Switch Waveforms



Notes:

①Calculated continuous current based on maximum allowable junction 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 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C

Typical Electrical and Thermal Characteristics

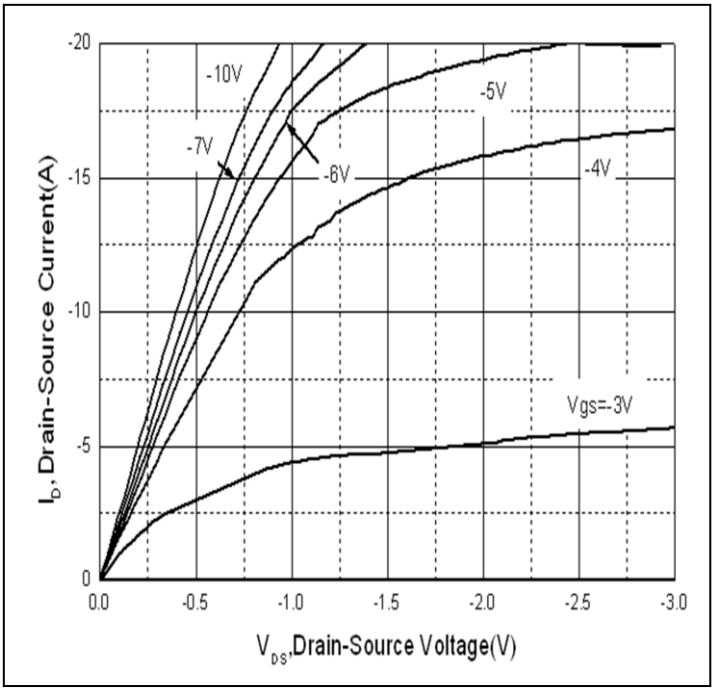


Figure1. Typical Output Characteristics

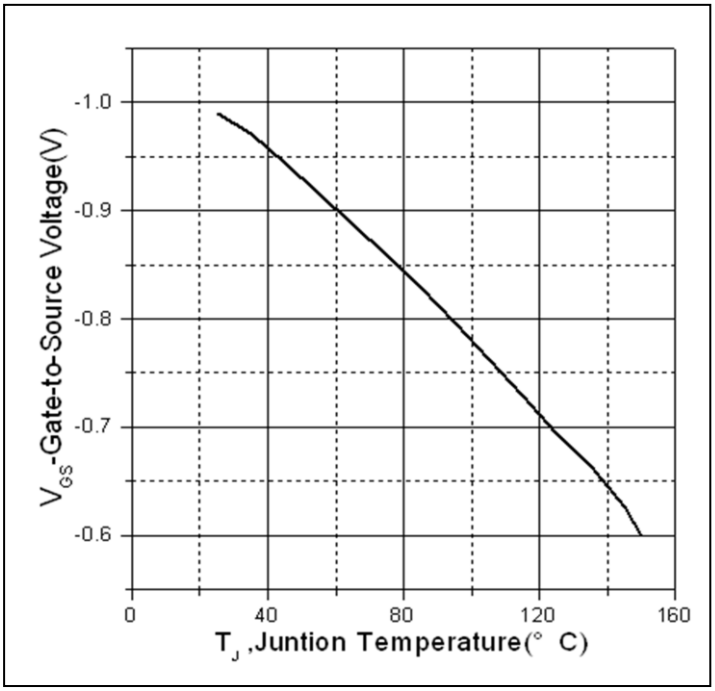


Figure2. Gate to Source Cut-off Voltage

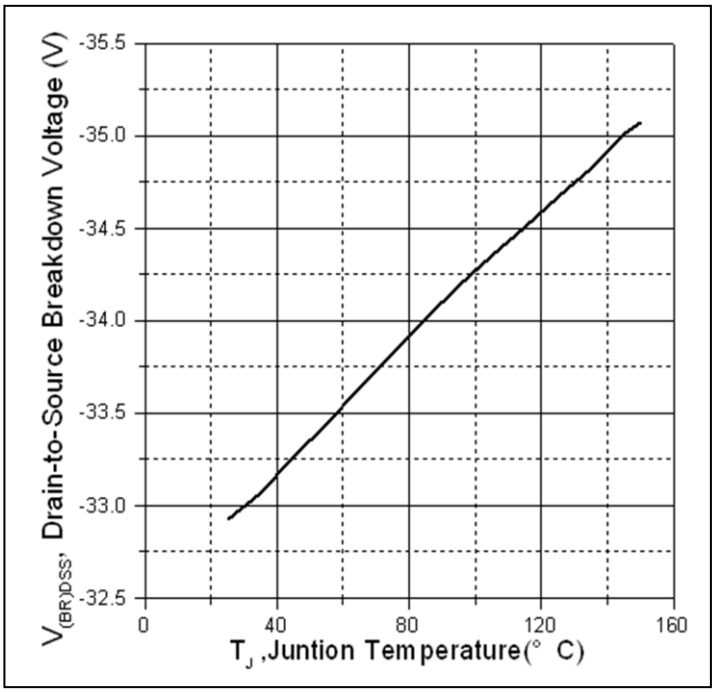


Figure3. Drain-to-Source Breakdown Voltage vs. Junction Temperature

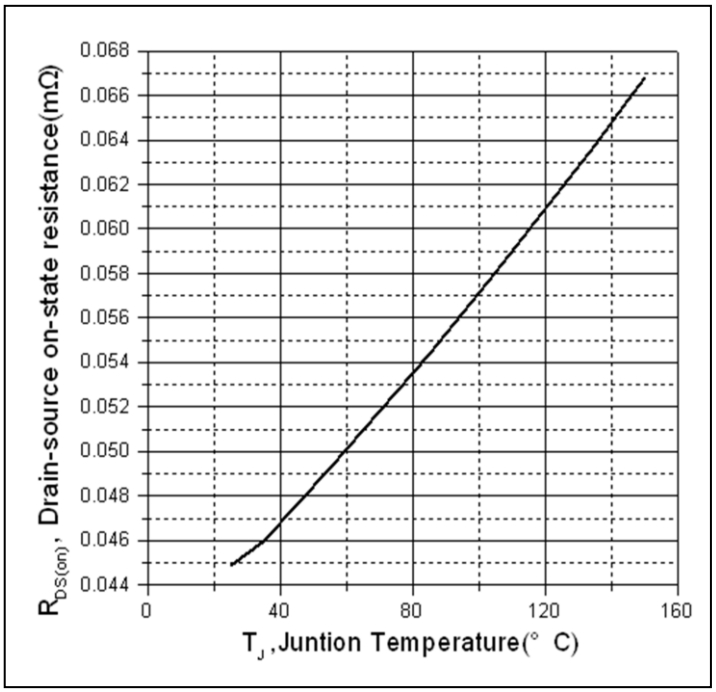


Figure4. Normalized On-Resistance vs. Junction Temperature

Typical Electrical and Thermal Characteristics

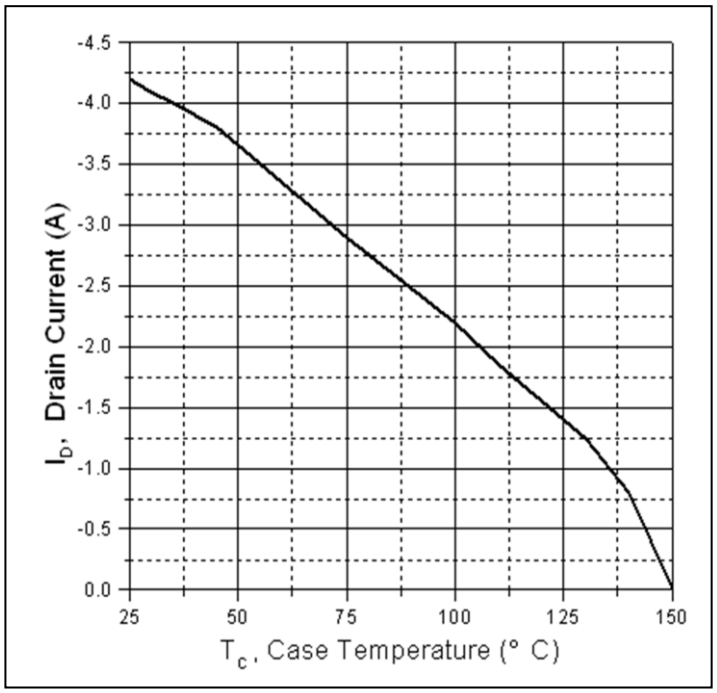


Figure5. Maximum Drain Current vs. Case Temperature

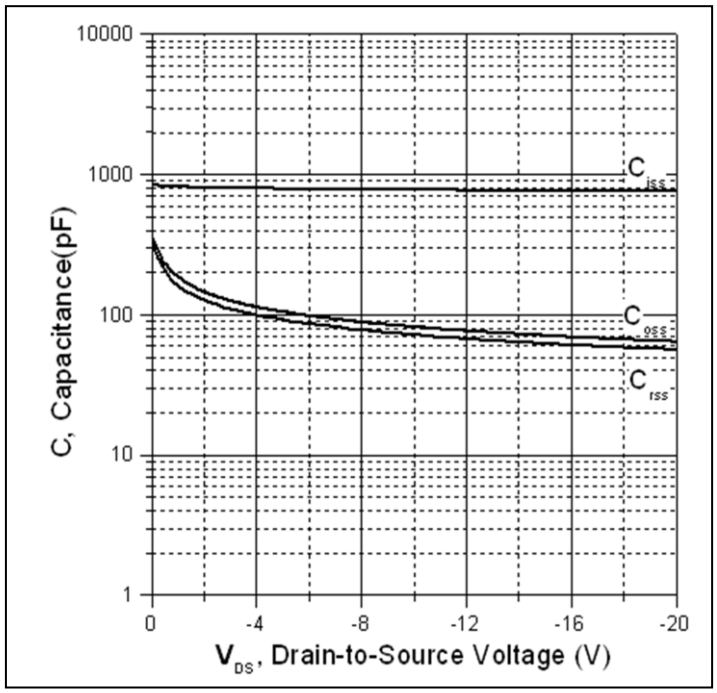


Figure6. Typical Capacitance vs. Drain-to-Source Voltage

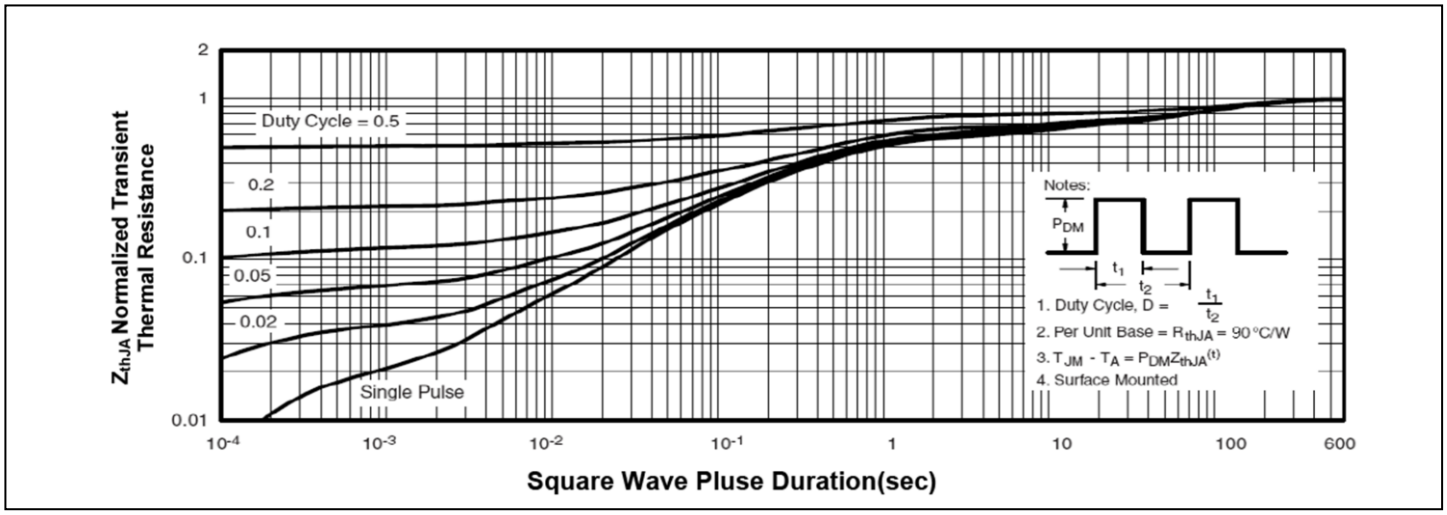
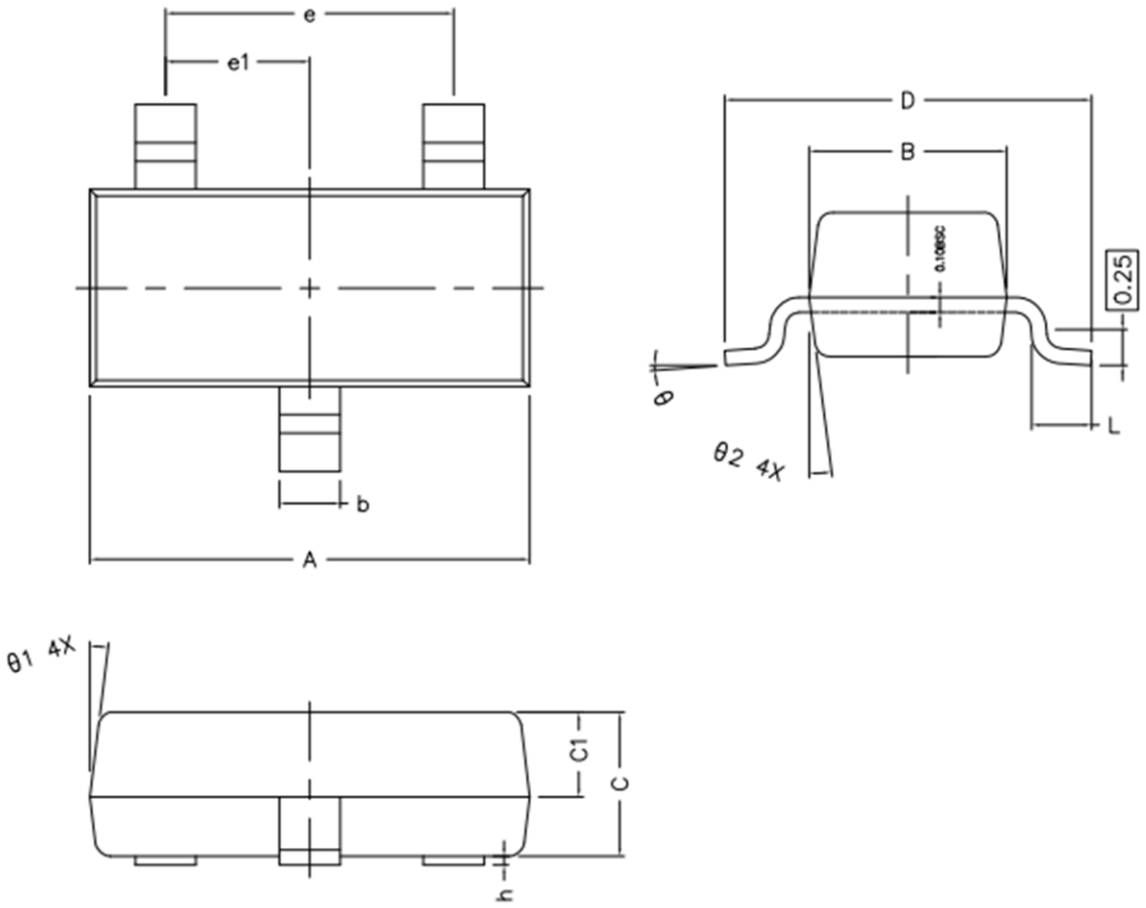


Figure7. Maximum Effective Transient Thermal Impedance Junction-to-Case

Mechanical Data：

SOT-23 Package Outline(Unit:mm)



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	2.800	2.900	3.000
B	1.200	1.300	1.400
C	0.900	1.000	1.100
C1	0.500	0.550	0.600
D	2.300	2.400	2.500
L	0.300	0.400	0.500
h	0.010	0.050	0.100
b	0.350	0.400	0.450
e	1.90 TYPE		
e1	0.95 TYPE		
θ_1	7° TYPE		
θ_2	7° TYPE		
θ	0° ~ 7°		

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