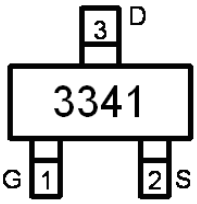
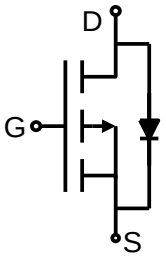
Main Product Characteristics:

V_{DSS}	-30V
R_{DS}(on)	39mΩ (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
- Add "HF" for Halogen Free

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: @T_A=25℃ unless otherwise specified

Symbol	Parameter	Max.	Units
I_D @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V ①	-4.2	A
I_D @ TC = 70°C	Continuous Drain Current, V_{GS} @ 10V ①	-3.5	
I_{DM}	Pulsed Drain Current ②	-30	
P_D @TC = 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

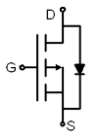
Thermal Resistance

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

Electrical Characterizes @T_A=25℃ unless otherwise specified

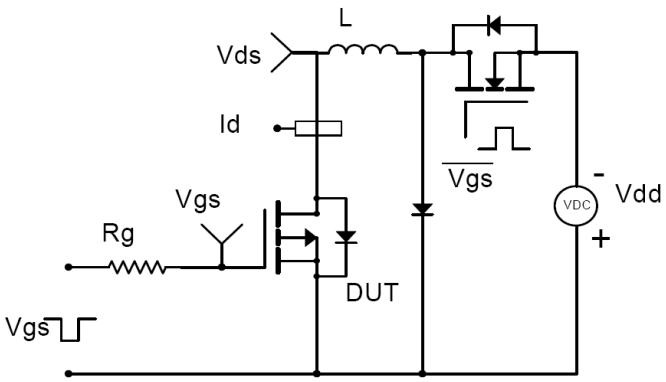
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-30	—	—	V	V_{GS} = 0V, I_D = -250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	39	50	mΩ	V_{GS}=-10V,I_D = -4.2A
		—	48	65		V_{GS}=-4.5V,I_D = -4A
		—	68	120		V_{GS}=-2.5V,I_D = -1A
$V_{GS(th)}$	Gate threshold voltage	-0.7	—	-1.3	V	V_{DS} = V_{GS}, I_D = -250μA
		—	-0.68	—		T_J = 125°C
I_{DSS}	Drain-to-Source leakage current	—	—	-1	μA	V_{DS} = -24V,V_{GS} = 0V
		—	—	-50		T_J = 125°C
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =12V
		—	—	-100		V_{GS} = -12V
Q_g	Total gate charge	—	18	—	nC	I_D = -4A,
Q_{gs}	Gate-to-Source charge	—	2.1	—		V_{DS}=-25V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	2.7	—		V_{GS} = -10V
$t_{d(on)}$	Turn-on delay time	—	7.5	—	ns	V_{GS}=-10V, V_{DS} =-15V, R_{GEN}=3Ω
t_r	Rise time	—	15	—		
$t_{d(off)}$	Turn-Off delay time	—	26	—		
t_f	Fall time	—	3.7	—		
C_{iss}	Input capacitance	—	712	—	pF	V_{GS} = 0V,
C_{oss}	Output capacitance	—	82	—		V_{DS} =-15V,
C_{rss}	Reverse transfer capacitance	—	67	—		f = 1MHz

Source-Drain Ratings and Characteristics

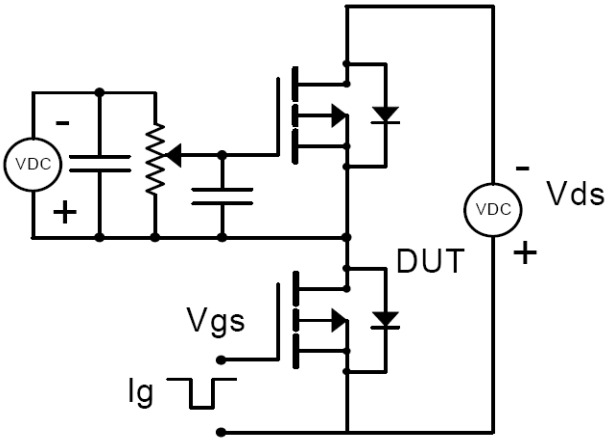
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	-4.2	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-30	A	
V_{SD}	Diode Forward Voltage	—	-0.78	-1.0	V	I_S=-1A, V_{GS}=0V

Test Circuits and Waveforms

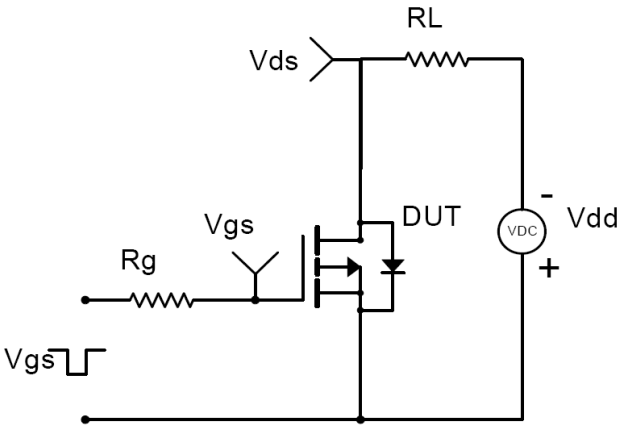
EAS Test Circuit:



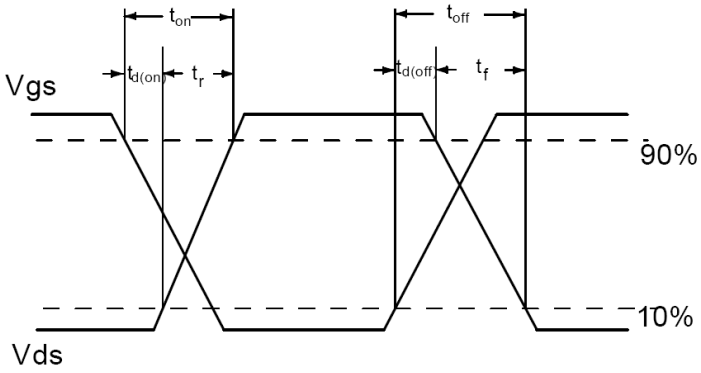
Gate Charge Test Circuit:



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 TA =25°C

Typical Electrical and Thermal Characteristics

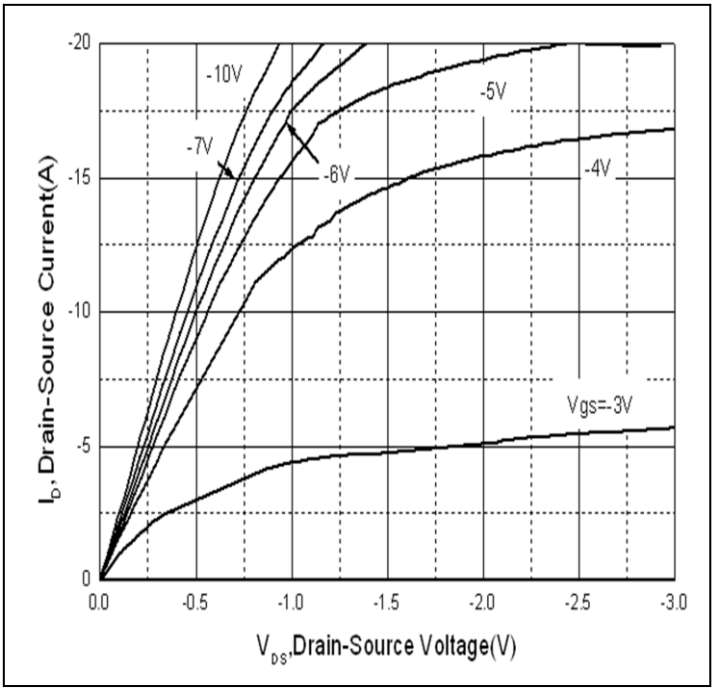


Figure 1. Typical Output Characteristics

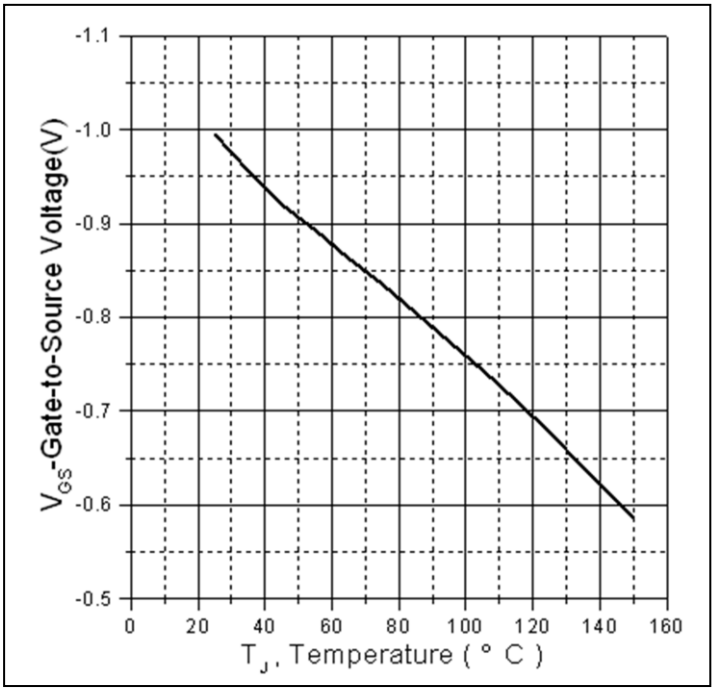


Figure 2. Gate to Source Cut-off Voltage

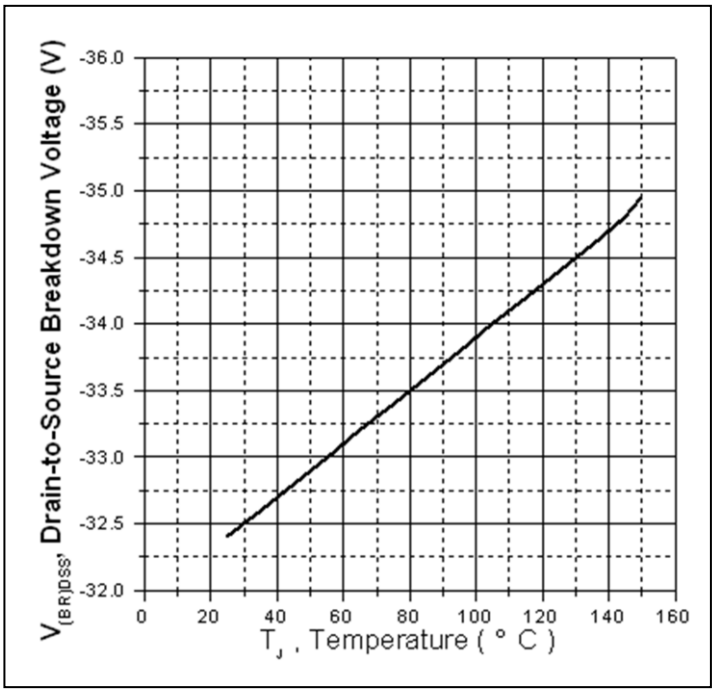


Figure 3. Drain-to-Source Breakdown Voltage vs. Junction Temperature

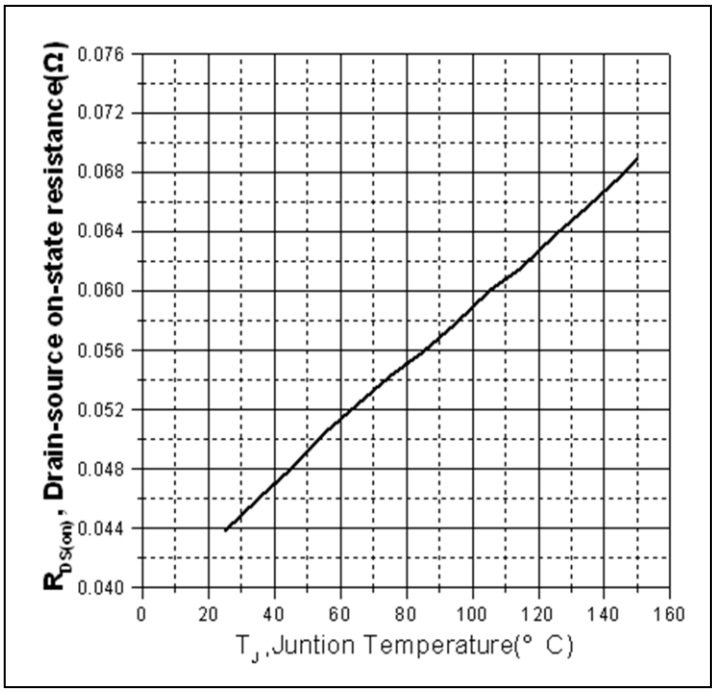


Figure 4. Normalized On-Resistance vs. Junction Temperature

Typical Electrical and Thermal Characteristics

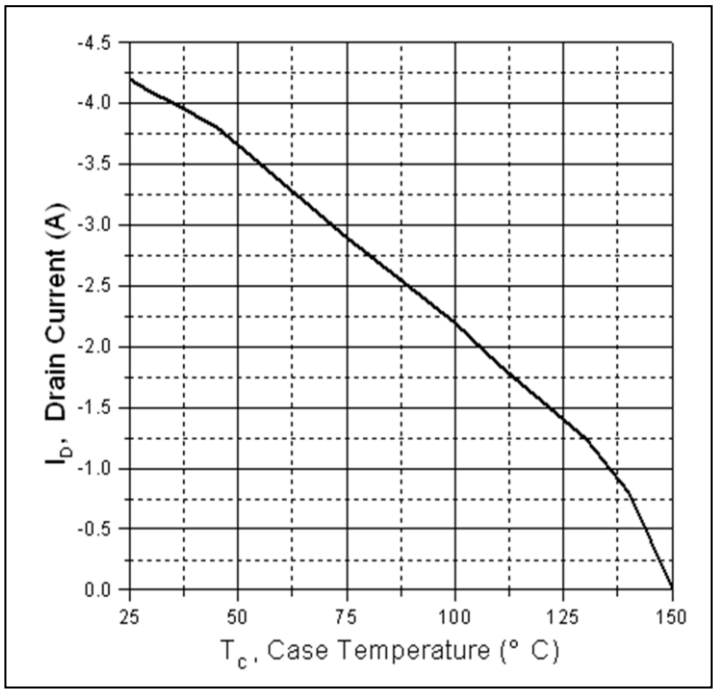


Figure 5. Maximum Drain Current vs. Case Temperature

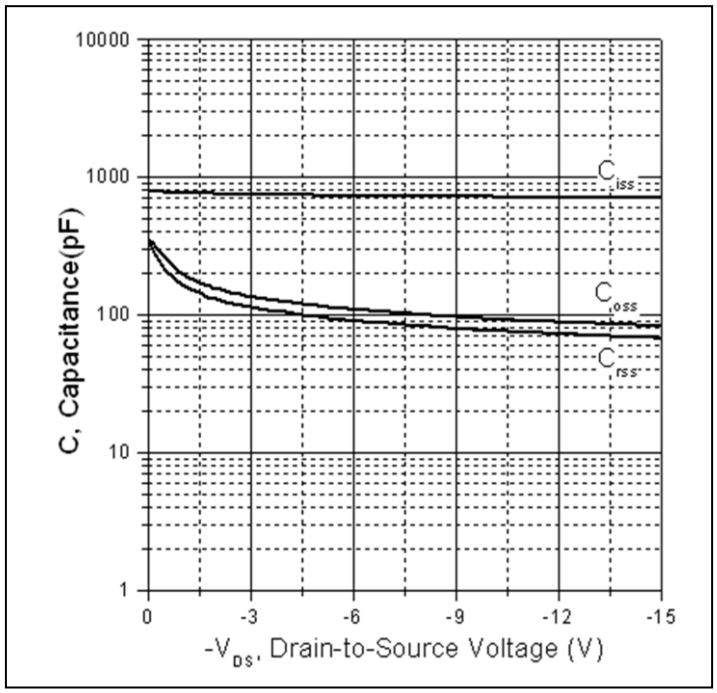


Figure 6. Typical Capacitance vs. Drain-to-Source Voltage

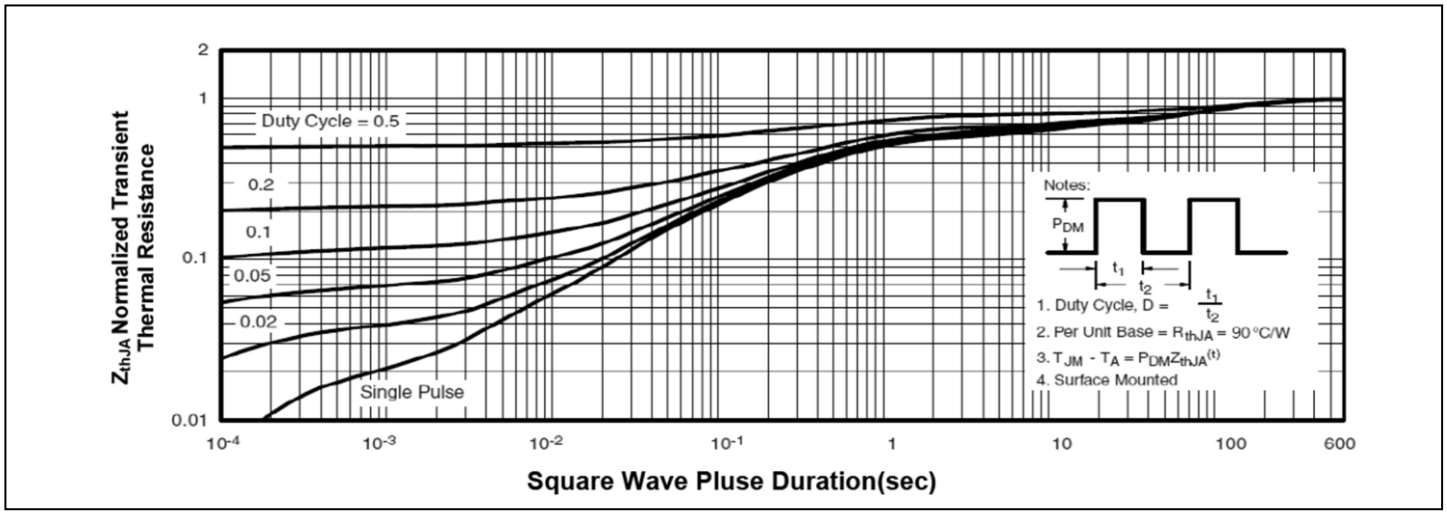
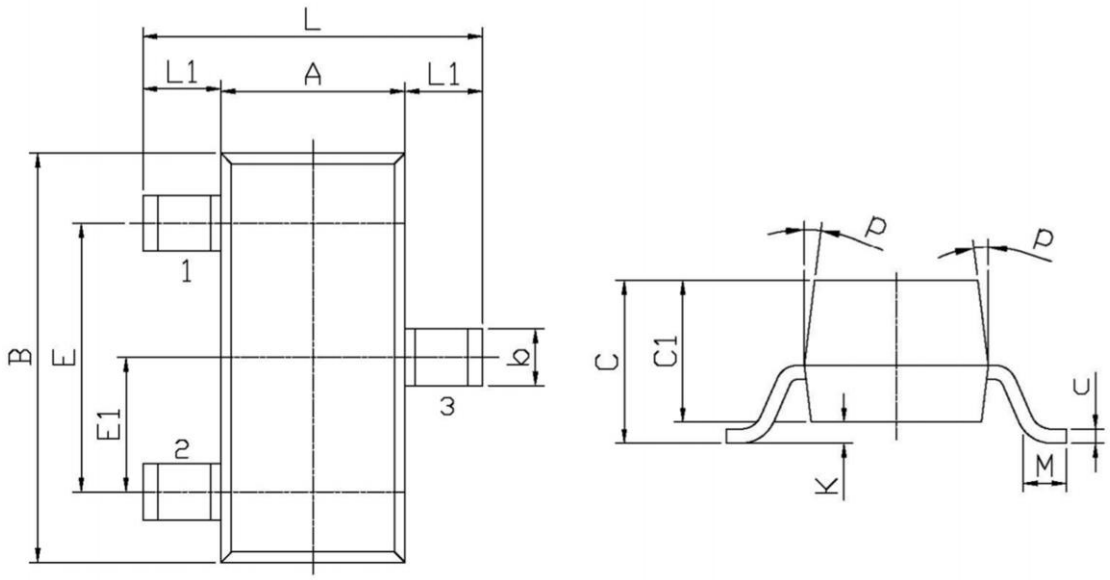


Figure7. Maximum Effective Transient Thermal Impedance Junction-to-Case

Mechanical Data:



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.2	2.7	C	1.30Max	
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	0.20MIN	
E1	0.85	1.05	P	7°	
b	0.35	0.55			

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