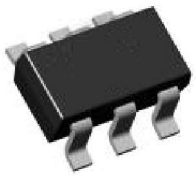
SSF2418E

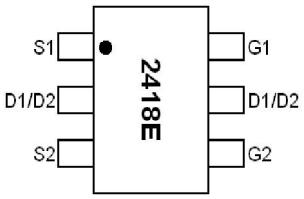
20V Dual N-Channel MOSFET

Main Product Characteristics

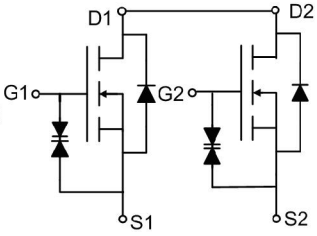
V_{DSS}	20V
R_{DS}(on)	18mohm(typ.)
I_D	6A



SOT23-6



Marking and Pin Assignment



Schematic Diagram

Features and Benefits

- Advanced trench 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
- Lead free product

Description

It utilizes the latest trench 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} @ 10V①	6	A
I_{DM}	Pulsed Drain Current②	30	
P_D @TC = 25°C	Power Dissipation③	1.3	W
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-to-Source Voltage	± 12	V
ESD	ESD Rating (HBM)	2	KV
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

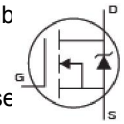
Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s) ④	—	95	℃/W

Electrical Characteristics @T_A=25℃ unless otherwise specified

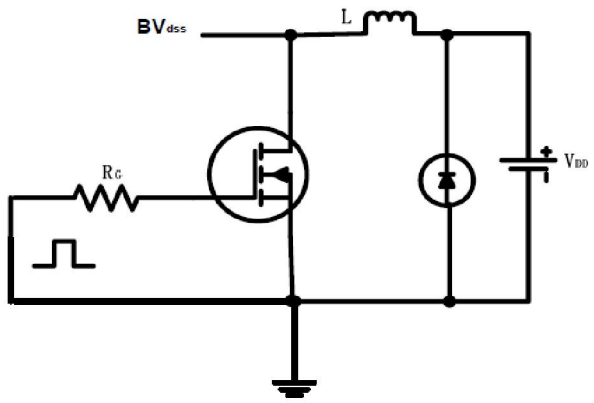
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	20	—	—	V	V_{GS} = 0V, ID = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	18	21	mΩ	V_{GS}=4.5V,I_D = 6A
		—	19	22		V_{GS}=4V,I_D = 5.5A
		—	21	26		V_{GS}=3.1V,I_D = 5A
		—	25	30		V_{GS}=2.5V,I_D = 4A
$V_{GS(th)}$	Gate threshold voltage	0.5	—	1	V	V_{DS} = V_{GS}, I_D = 250μA
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} = 20V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	10	μA	V_{GS} =10V
		-10	—	—		V_{GS} = -10V
g_{FS}	Forward Transconductance	—	7	—	S	V_{DS}=5V,I_D=6A
Q_g	Total gate charge	—	8	—	nC	V_{DS}=10V,
Q_{gs}	Gate-to-Source charge	—	1.5	—		I_D=6A,
Q_{gd}	Gate-to-Drain("Miller") charge	—	2	—		V_{GS}=4.5V
$t_{d(on)}$	Turn-on delay time	—	20	—	ns	V_{DD}=10V,I_D=1A
t_r	Rise time	—	50	—		V_{GS}=4.5V,R_{GEN}=10Ω
$t_{d(off)}$	Turn-Off delay time	—	64	—		
t_f	Fall time	—	40	—		
C_{iss}	Input capacitance	—	650	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	170	—		V_{DS} = 10V
C_{rss}	Reverse transfer capacitance	—	150	—		f = 1.0MHz

Source-Drain Ratings and Characteristics

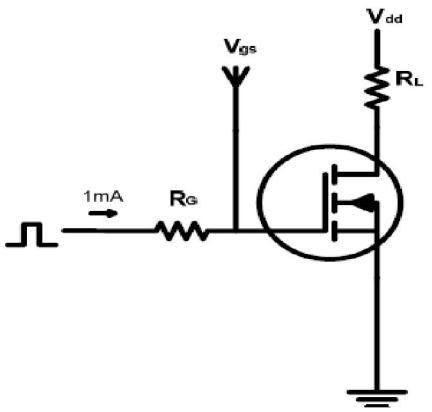
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	6	A	MOSFET symb showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	30	A	
V_{SD}	Diode Forward Voltage	—	0.76	1.1	V	I_S=1A, V_{GS}=0V

Test Circuits and Waveforms

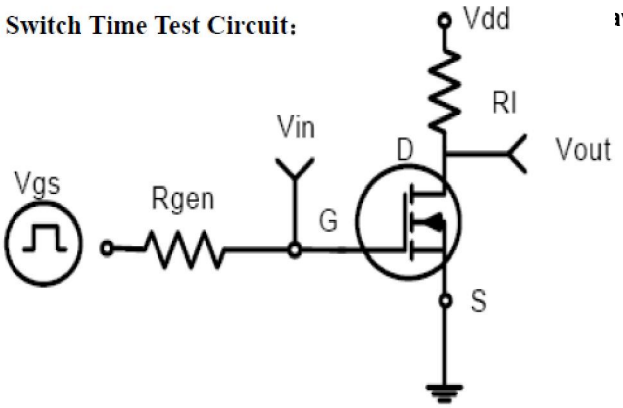
EAS test circuits:



Gate charge test circuit:



Switch Time Test Circuit:



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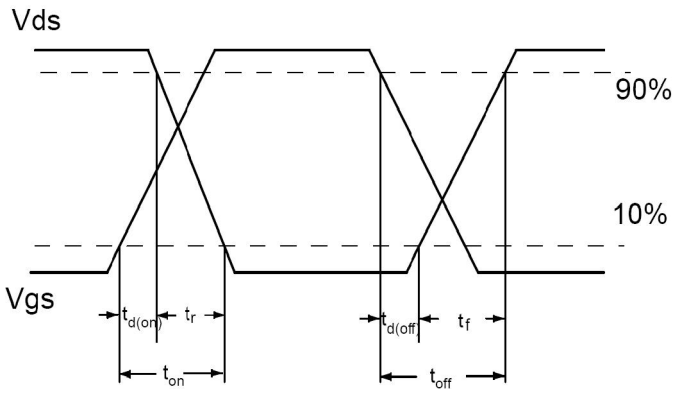


Typical Electrical and Thermal Characteristics

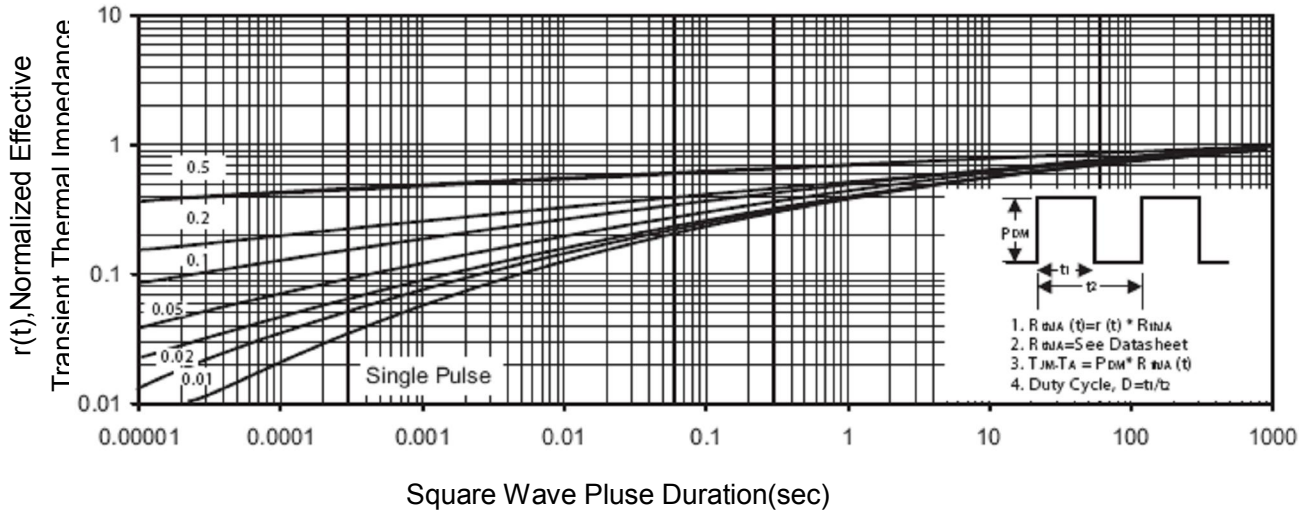


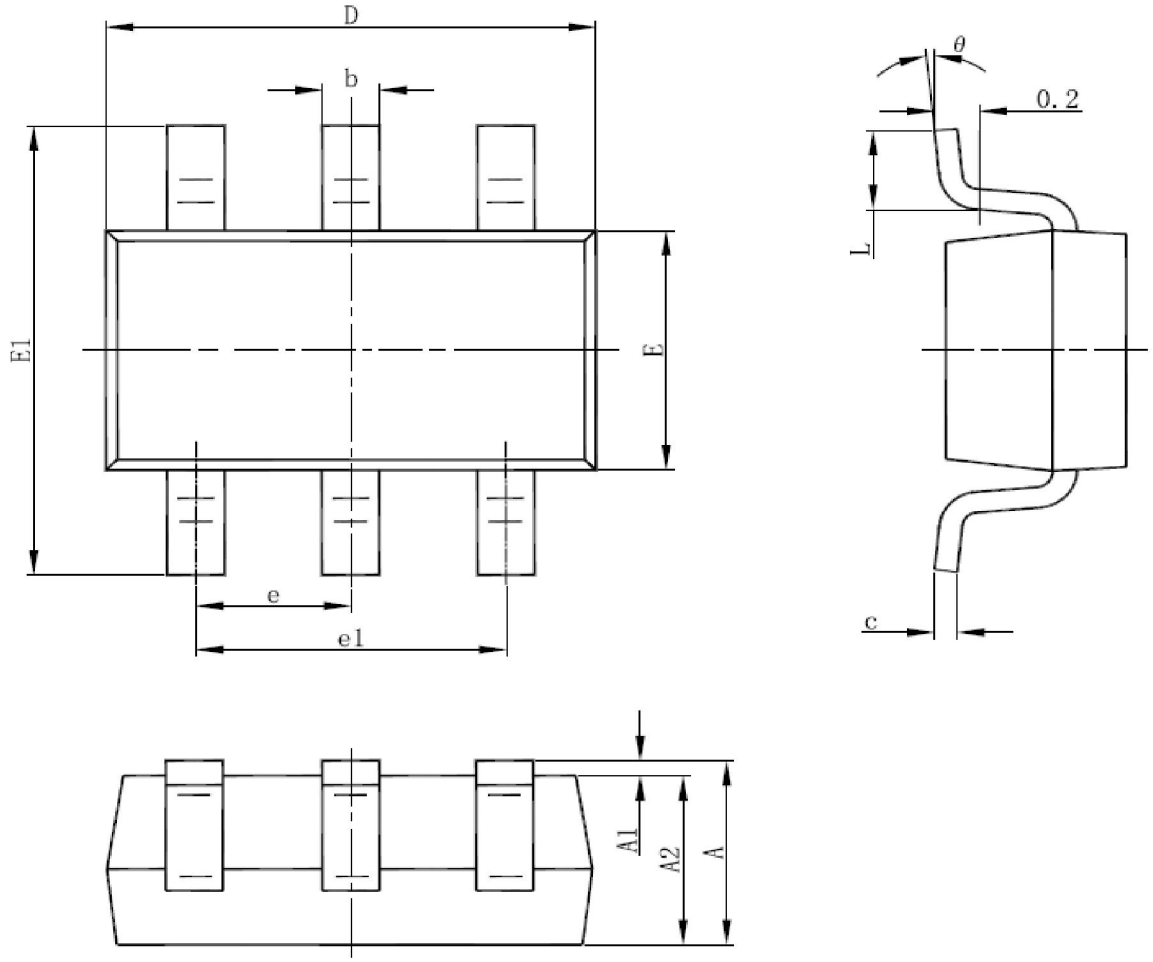
Figure 1 Normalized Maximum Transient Thermal Impedance

Notes:

①The maximum current rating is limited by bond-wires.
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
⑤These curves are based on the junction-to-case thermal impedence which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=150°C.
⑥ The maximum current rating is limited by bond-wires.

Mechanical Data

SOT-23-6L PACKAGE OUTLINE DIMENSION



Symbol	Dimension In Millimeters		Dimension In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.95(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0^0	8^0	0^0	8^0

Ordering and Marking Information

Device Marking: 2418E

Package (Available)
SOT23-6
Operating Temperature Range
C : -55 to 150 ºC

Devices per Unit

Package Type	Units/ Tape	Tapes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
SOT23-6	3000	10	30000	4	120000

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	T_j=125℃ to 150℃ @ 80% of Max V_{DSS}/V_{CES}/VR	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	T_j=150℃@ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices