

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

Features

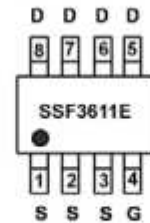
- ◆ Advanced MOSFET process technology
- ◆ Special designed for PWM, load switching and general purpose applications
- ◆ Ultra low on-resistance with low gate charge
- ◆ Fast switching and reverse body recovery
- ◆ 150°C operating temperature

Main Product Characteristics

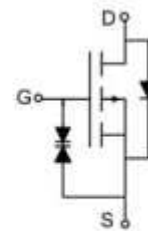
V_{DS}	-30V
$R_{DS(on)}$	10.6mΩ (typ.)
I_D	-12A



SOP-8



Marking and pin
Assignment



Schematic diagram

Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
I_D @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V ^①	-12	A
I_D @ TC = 100°C	Continuous Drain Current, V_{GS} @ 10V ^①	-7.4	
I_{DM}	Pulsed Drain Current ^②	-48	
P_D @ TC = 25°C	Power Dissipation ^③	2	W
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-to-Source Voltage	± 20	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	—	62.5	°C/W

**ELECTRICAL CHARACTERISTICS** ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

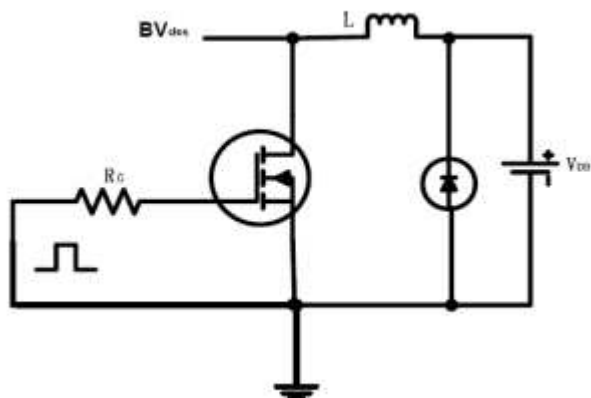
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	10.6	13	$m\Omega$	$V_{GS} = -10.0V, I_D = -10.0A$
		—	14.1	16		$V_{GS} = -4.50V, I_D = -7.50A$
$V_{GS(th)}$	Gate threshold voltage	-1	—	-2	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source leakage current	—	—	-1	μA	$V_{DS} = -30V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source forward leakage	—	—	10	μA	$V_{GS} = 20V$
		—	—	-10		$V_{GS} = -20V$
Q_g	Total gate charge	—	55	—	nC	$I_D = -10A,$ $V_{DS} = -25V,$ $V_{GS} = -10V$
Q_{gs}	Gate-to-Source charge	—	3.5	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	18	—		
$t_{d(on)}$	Turn-on delay time	—	8	—	ns	$V_{GS} = -10V, V_{DS} = -15V,$ $R_L = 15\Omega,$ $R_{GEN} = 3\Omega$
t_r	Rise time	—	5.8	—		
$t_{d(off)}$	Turn-Off delay time	—	56	—		
t_f	Fall time	—	38	—		
C_{iss}	Input capacitance	—	3224	—	pF	$V_{GS} = 0V$ $V_{DS} = -15V$ $f = 1MHz$
C_{oss}	Output capacitance	—	459	—		
C_{rss}	Reverse transfer capacitance	—	425	—		

Source-Drain Ratings and Characteristics

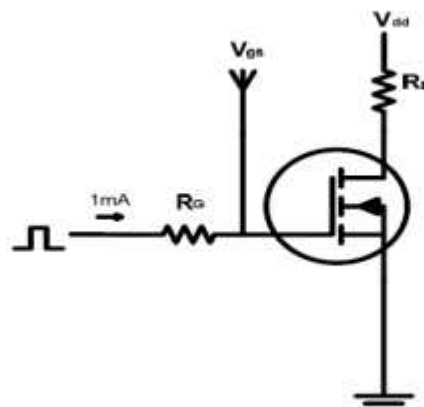
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-12	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-48	A	
V_{SD}	Diode Forward Voltage	—	-0.73	-1.2	V	$I_S = -2.1A, V_{GS} = 0V$
t_{rr}	Reverse Recovery Time	—	16	—	ns	$T_J = 25^{\circ}\text{C}, I_F = -10A,$ $di/dt = 100A/\mu s$
Q_{rr}	Reverse Recovery Charge	—	5.9	—	nC	

Test circuits and Waveforms

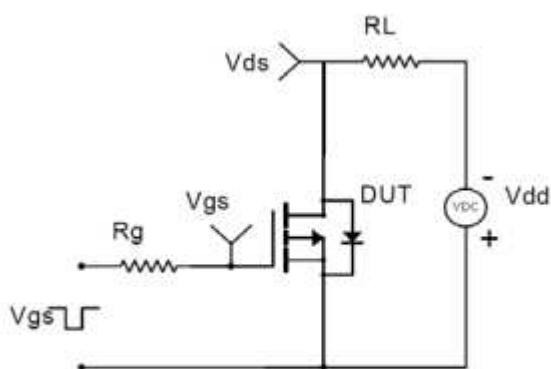
EAS test circuits:



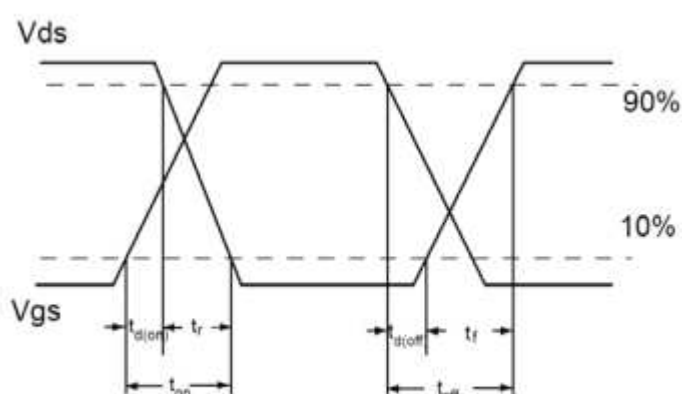
Gate charge test circuit:



Switch time test circuit:



Switch Waveforms:



Notes:

- ① The maximum current rating is limited by bond-wires.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-ambient thermal resistance.
- ④ The 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 $T_A = 25^\circ C$
- ⑤ These curves are based on the junction-to-case thermal imedence which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)} = 150^\circ C$.

Ordering and Marking Information

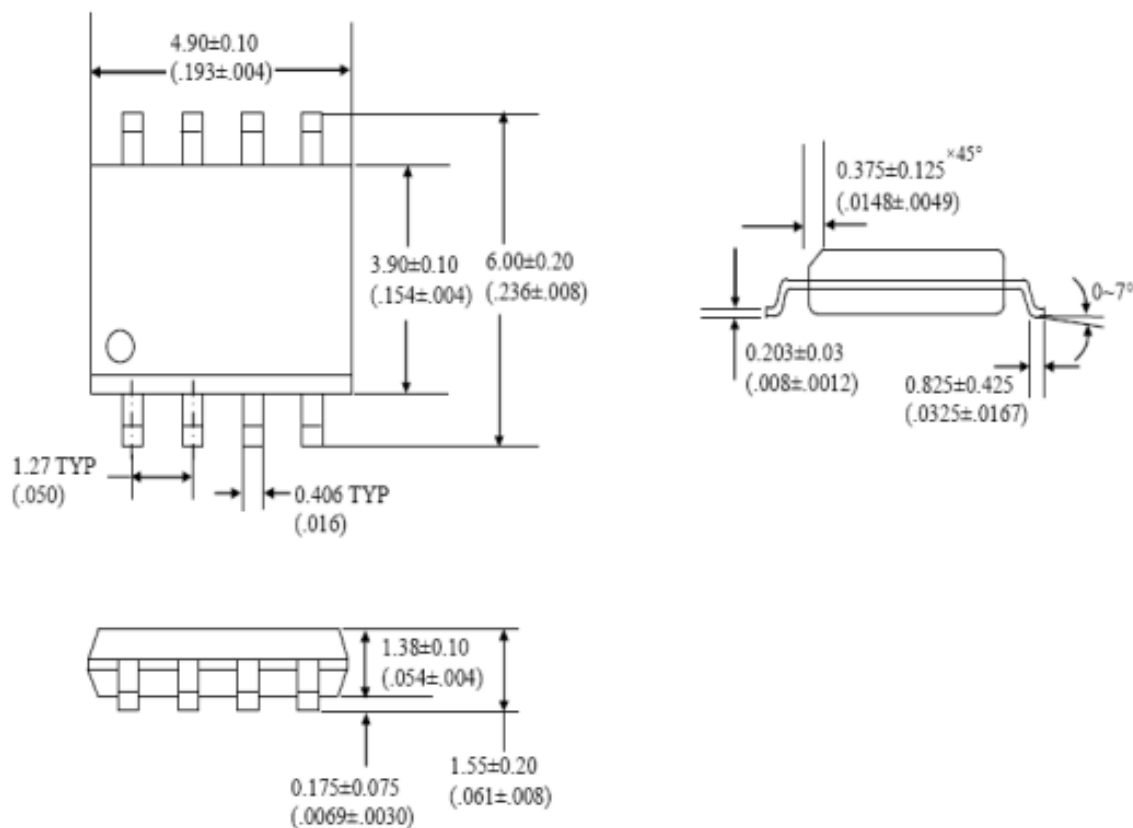
EC733611E XX X

R : Tape & Reel

M1 = SOP 8

Part Number	Package	Marking
EC733611EM1R	SOP 8L	SSF3611E YYWW

SOP 8L Package Outline Dimension



Symbol	Dimension In Millimeters		Dimension In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.280	1.480	0.050	0.058
b	0.406		0.016	
c	0.173	0.233	0.007	0.009
D	4.800	5.000	0.189	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.27TYP		0.050TYP	
L	0.400	1.250	0.016	0.050