

SE3407

**P-Channel Enhancement-Mode MOSFET**

Revision: A

**General Description**

Advanced trench technology to provide excellent RDS(ON), low gate charge and low operation voltage. This device is suitable for using as a load switch or in PWM applications.

- Simple Drive Requirement
- Small Package Outline
- Surface Mount Device

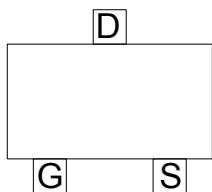
**Features**

For a single MOSFET

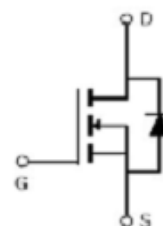
- $V_{DS} = -30V$
- $R_{DS(ON)} = 40m\Omega @ V_{GS}=-10V$

**Pin configurations**

See Diagram below



SOT-23 and SOT23-3



**Absolute Maximum Ratings**

Parameter		Symbol	Rating	Units
Drain-Source Voltage		$V_{DS}$	-30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Drain Current	Continuous	$I_D$	-4.1	A
	Pulsed		-20	
Total Power Dissipation	@TA=25°C	$P_D$	1.4	W
Operating Junction Temperature Range		$T_J$	-55 to 150	°C

## SE3407

Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS (Note 2)</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0 V	-30	-33		V
I <sub>DSS</sub>	Drain to Source Leakage Current	V <sub>DS</sub> = -24V, V <sub>GS</sub> =0V			-1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> = 20V			100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1	-1.5	-3	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.1A	-	40	65	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A		60	95	mΩ
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz		650		pF
C <sub>oss</sub>	Output Capacitance			105		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			65		pF
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-4A		12.5		nC
Q <sub>gs</sub>	Gate Source Charge			2.8		nC
Q <sub>gd</sub>	Gate Drain Charge			2.7		nC
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>GEN</sub> =3Ω, R <sub>L</sub> =3.6Ω		8.5		ns
t <sub>d(off)</sub>	Turn-Off Delay Time			26		ns
t <sub>d(r)</sub>	Turn-On Rise Time			4.5		ns
t <sub>d(f)</sub>	Turn-Off Fall Time			12.5		ns
<b>Thermal Resistance</b>						
Symbol	Parameter		Typ	Max	Units	
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient		-	90	°C/W	

Test Circuits and Waveform

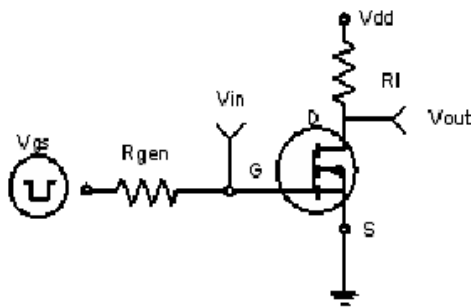


Figure 1: Switching Test Circuit

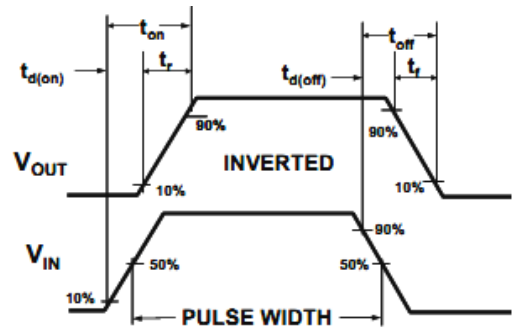


Figure 2: Switching Waveforms

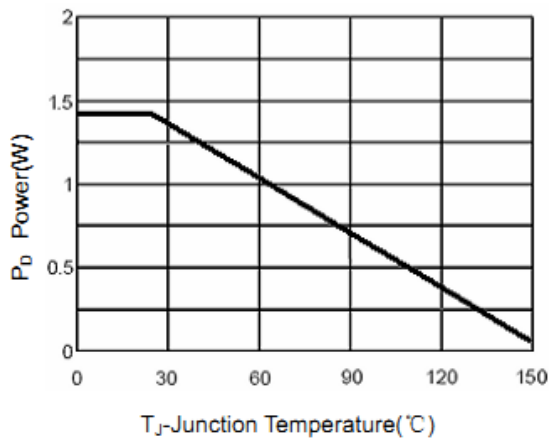


Figure 3 Power Dissipation

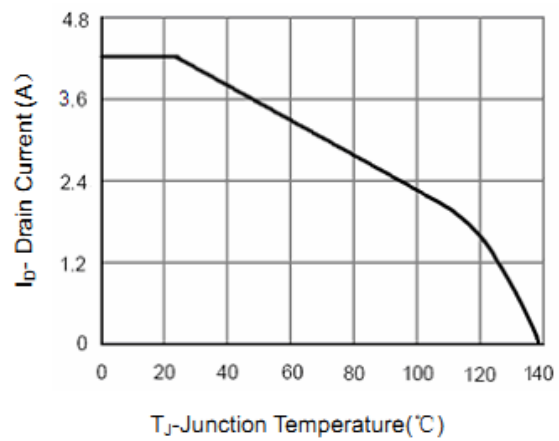


Figure 4 Drain Current

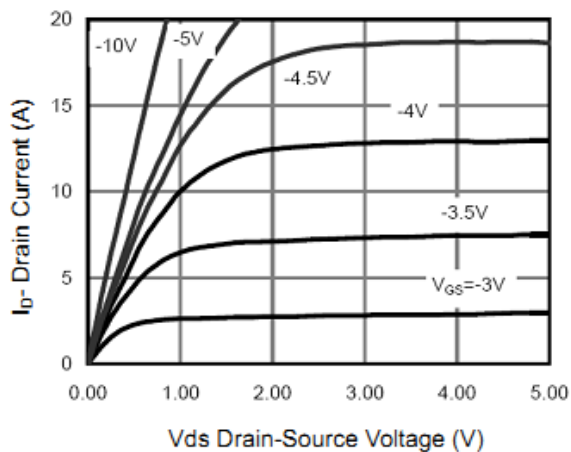


Figure 5 Output Characteristics

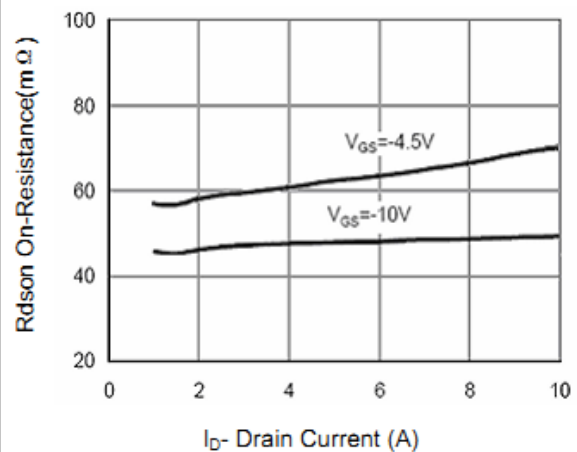


Figure 6 Drain-Source On-Resistance

Typical Characteristics

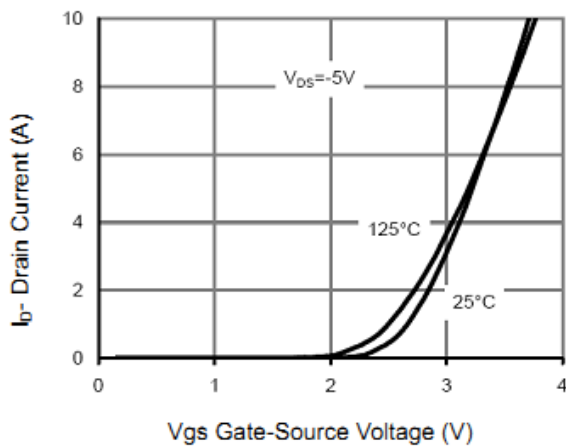


Figure 7 Transfer Characteristics

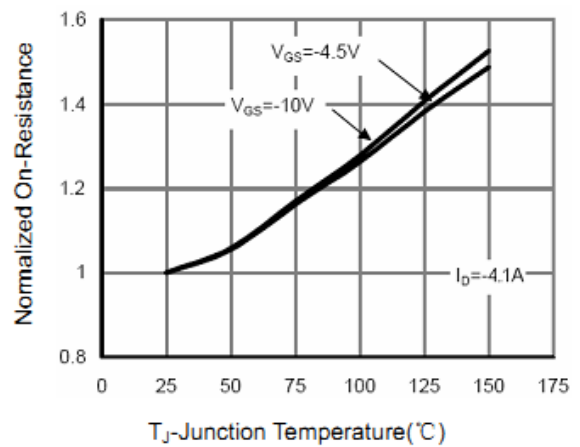


Figure 8 Drain-Source On-Resistance

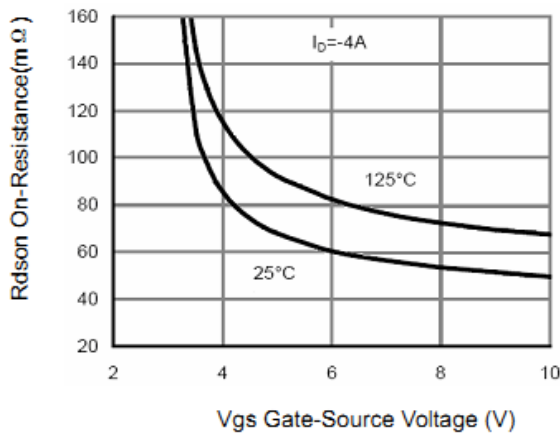


Figure 9 Rdson vs V\_GS

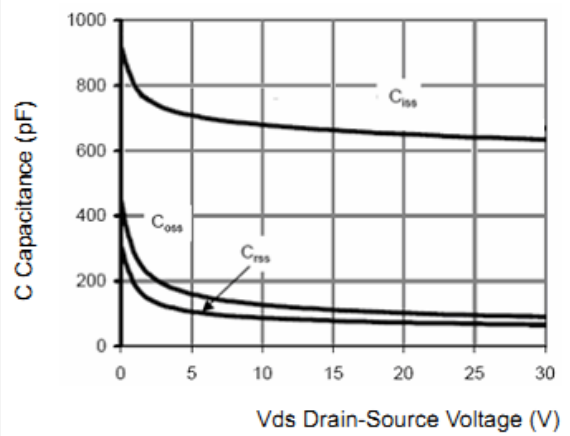


Figure 10 Capacitance vs V\_DS

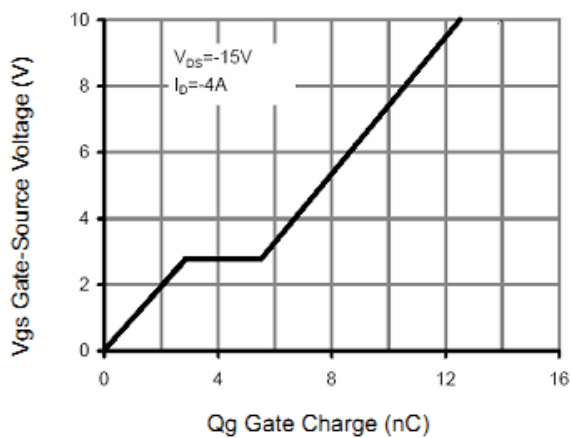


Figure 11 Gate Charge

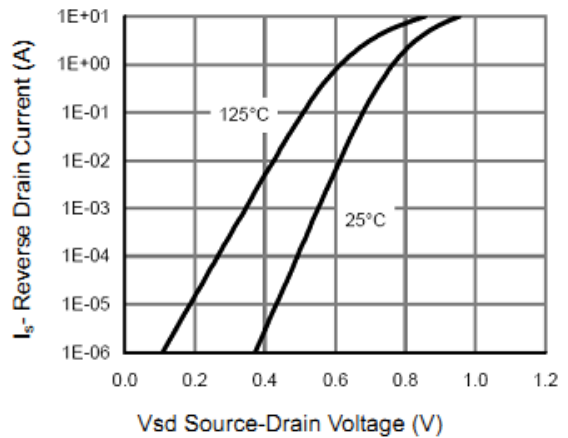


Figure 12 Source-Drain Diode Forward

Typical Characteristics

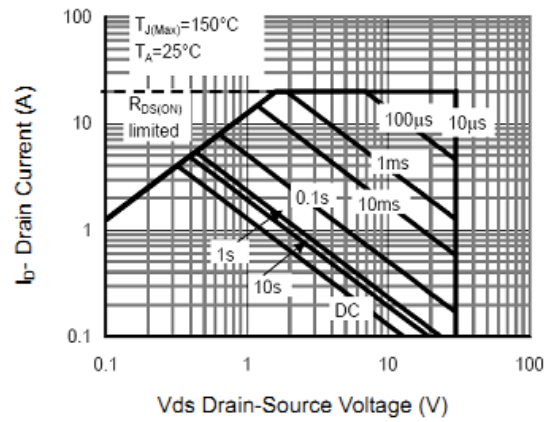


Figure 13 Safe Operation Area

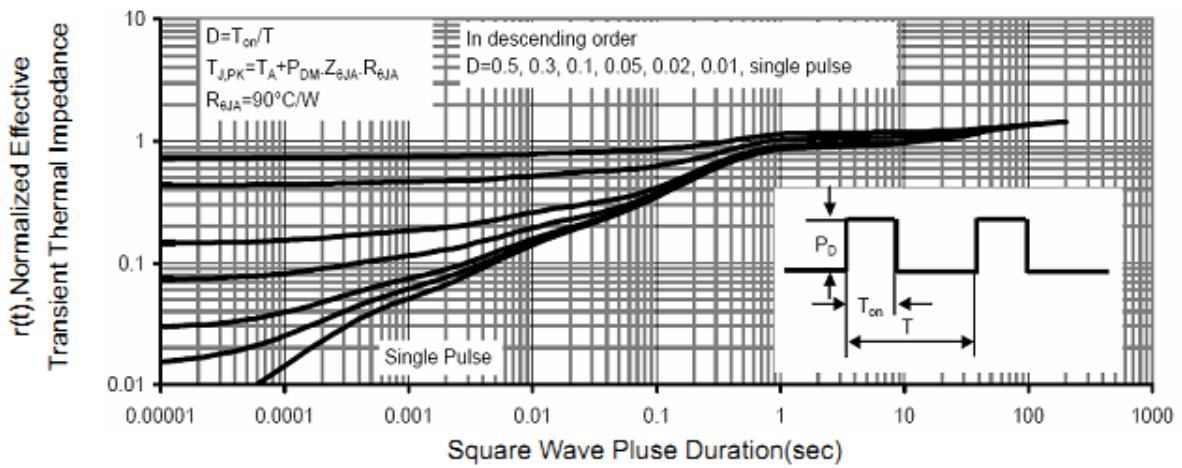
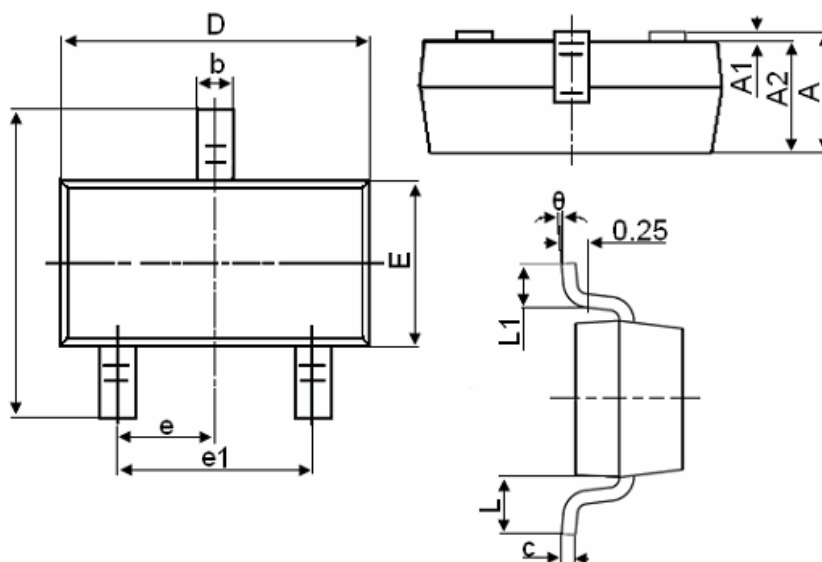


Figure 14 Normalized Maximum Transient Thermal Impedance

# SE3407

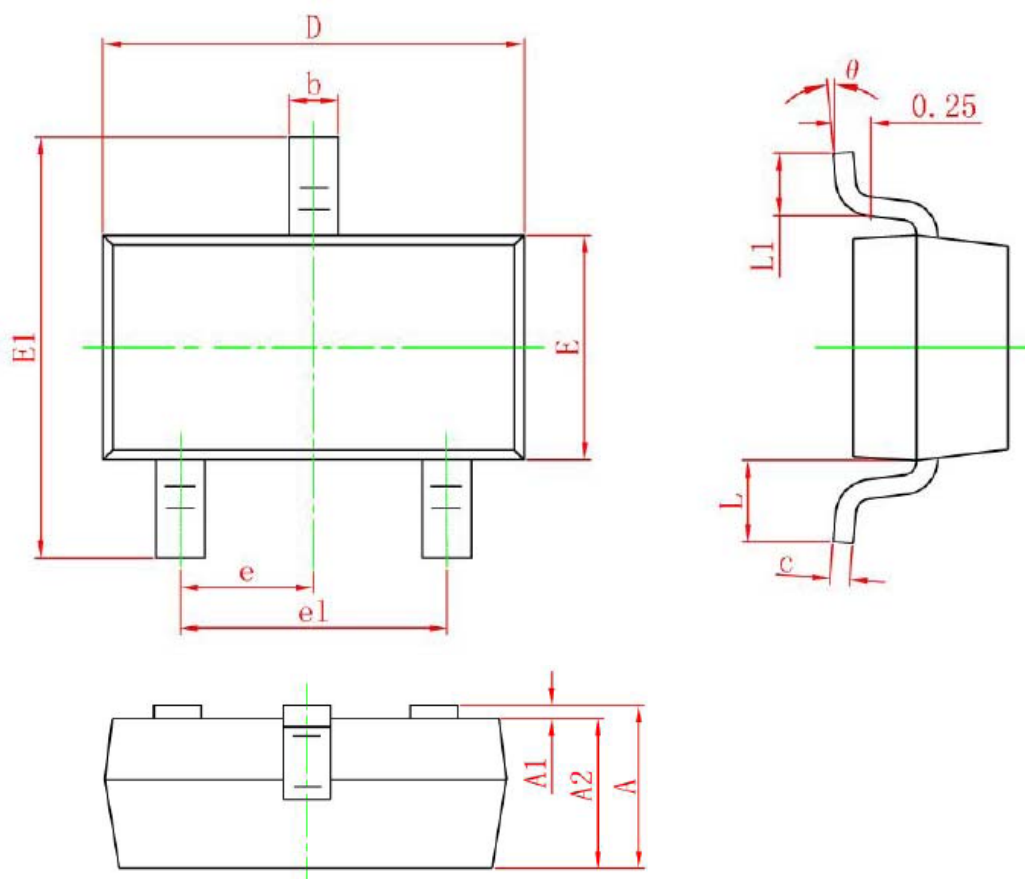
## Package Outline Dimension

### SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

## SOT-23-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
$\theta$	0°	8°	0°	8°

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