

SE3080A/K

**N-Channel Enhancement-Mode MOSFET**

Revision: A

**General Description**

Advanced trench technology to provide excellent  $R_{DS(ON)}$ , 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

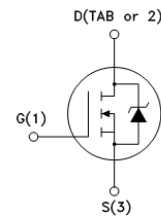
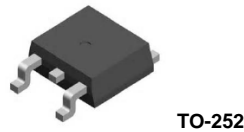
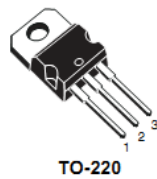
**Features**

For a single MOSFET

- $V_{DS} = 30V$
- $R_{DS(ON)} = 4.5m\Omega @ V_{GS}=10V(SE3080A)$
- $R_{DS(ON)} = 4.5m\Omega @ V_{GS}=10V(SE3080K)$

**Pin configurations**

See Diagram below



**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	$I_D$	80	A
	Pulsed		170	
Total Power Dissipation	@ $T_A=25^\circ C$	$P_D$	83	W
Derating factor			0.56	W/ $^\circ C$
Single pulse avalanche energy		$E_{AS}$	285	mJ
Operating Junction Temperature Range		$T_J$	-55 to 175	$^\circ C$

**Thermal Resistance**

Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance Junction to Case	-	1.8	$^\circ C/W$

## SE3080A/K

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			V
I <sub>DSS</sub>	Drain to Source Leakage Current	V <sub>DS</sub> = 30V, 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	1.6	3	V
R <sub>DS(ON)</sub> SE3080A	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	4.5	6.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =24A	-	7	9.5	mΩ
R <sub>DS(ON)</sub> SE3080K	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	4.5	6.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =24A	-	7.5	10	mΩ
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz		2330		pF
C <sub>oss</sub>	Output Capacitance			460		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			230		pF
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	V <sub>GS</sub> =10V, V <sub>DS</sub> =30V, I <sub>D</sub> =30A		51		nC
Q <sub>gs</sub>	Gate Source Charge			14		nC
Q <sub>gd</sub>	Gate Drain Charge			11		nC
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> =10V, V <sub>DS</sub> =10V, R <sub>GEN</sub> =2.7Ω I <sub>D</sub> =30A		20		ns
t <sub>d(off)</sub>	Turn-Off Delay Time			60		ns
t <sub>d(r)</sub>	Turn-On Rise Time			15		ns
t <sub>d(f)</sub>	Turn-Off Fall Time			10		ns

Typical Characteristics

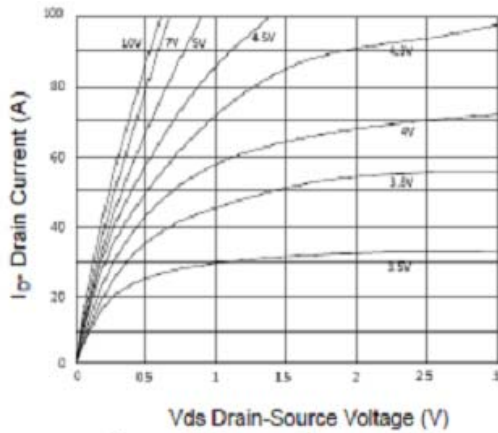


Figure 1 Output Characteristics

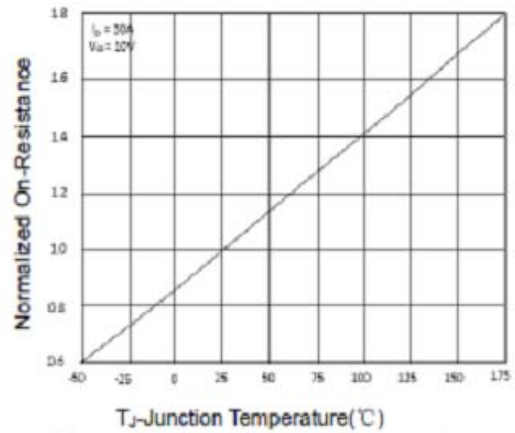


Figure 4 Rds(on)-Junction Temperature

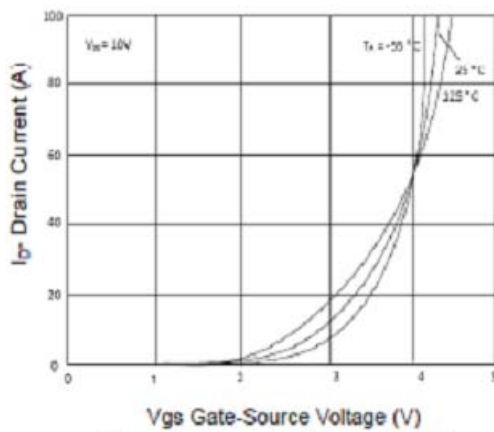


Figure 2 Transfer Characteristics

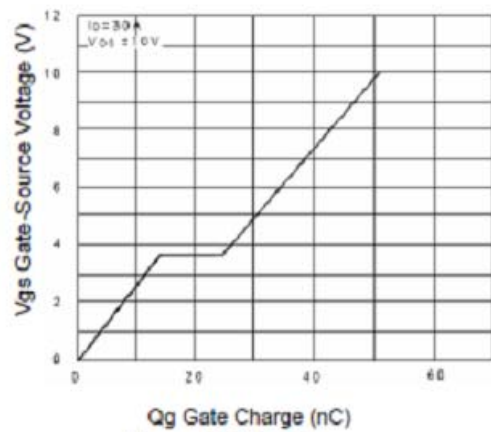


Figure 5 Gate Charge

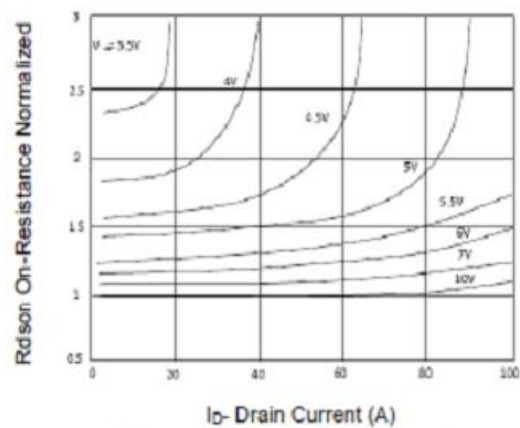


Figure 3 Rds(on)-Drain Current

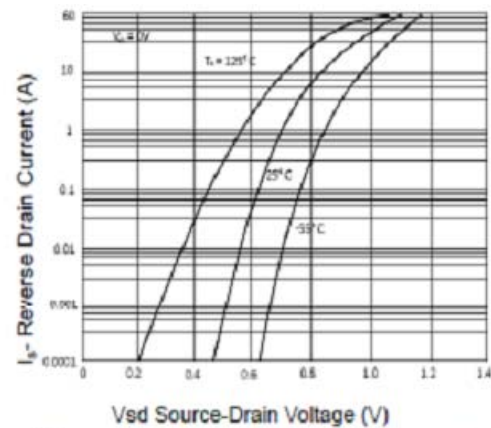


Figure 6 Source-Drain Diode Forward

Typical Characteristics

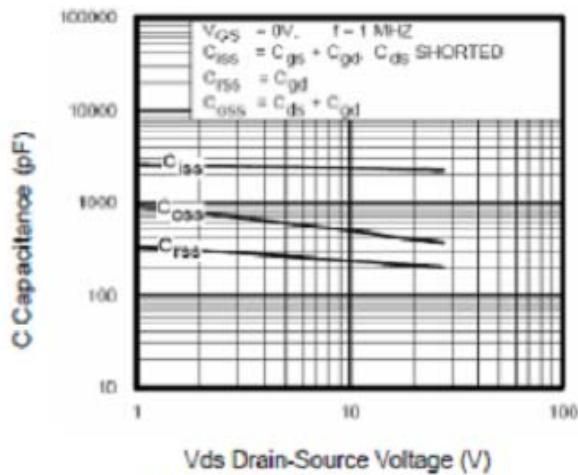


Figure 7 Capacitance vs Vds

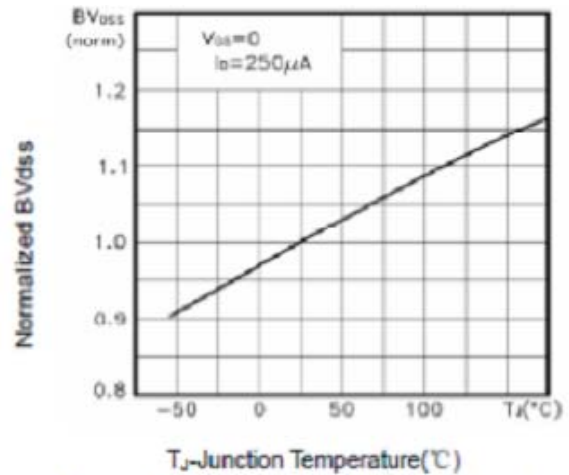


Figure 9 BV<sub>oss</sub> vs Junction Temperature

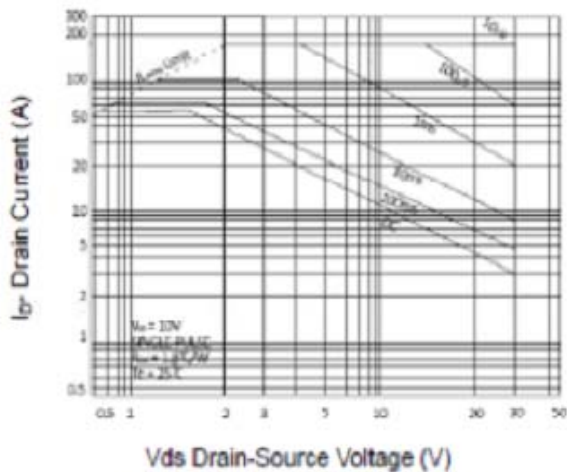


Figure 8 Safe Operation Area

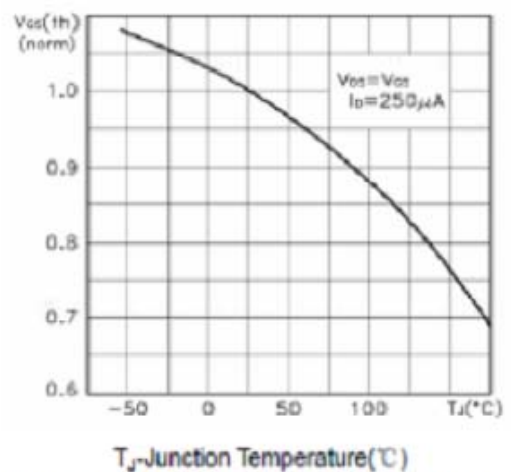


Figure 10 V<sub>GS(th)</sub> vs Junction Temperature

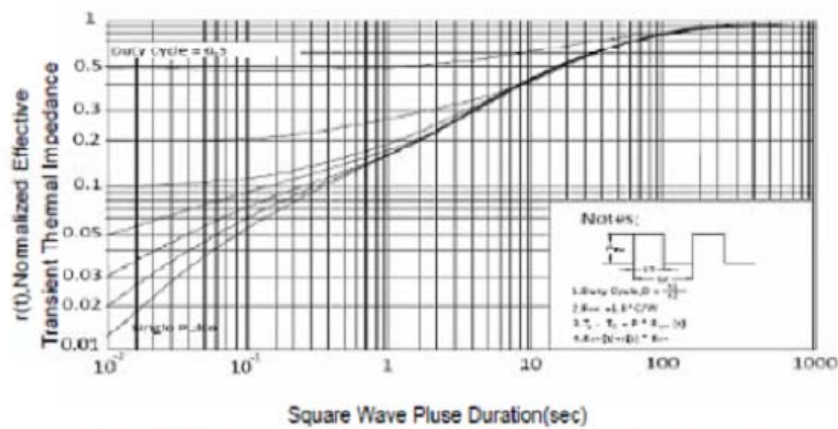
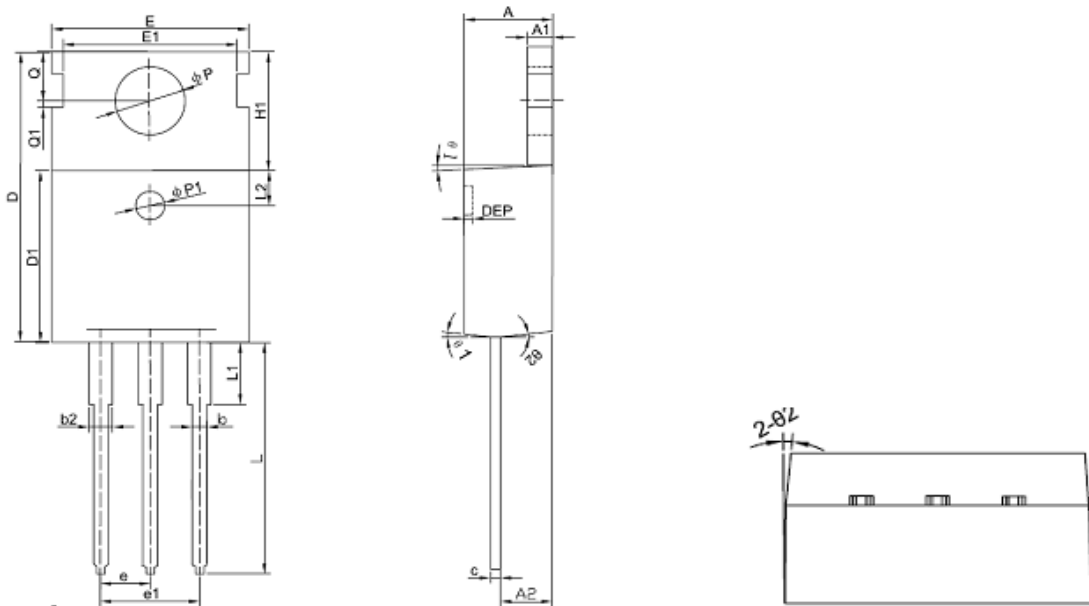


Figure 11 Normalized Maximum Transient Thermal Impedance

# SE3080A/K

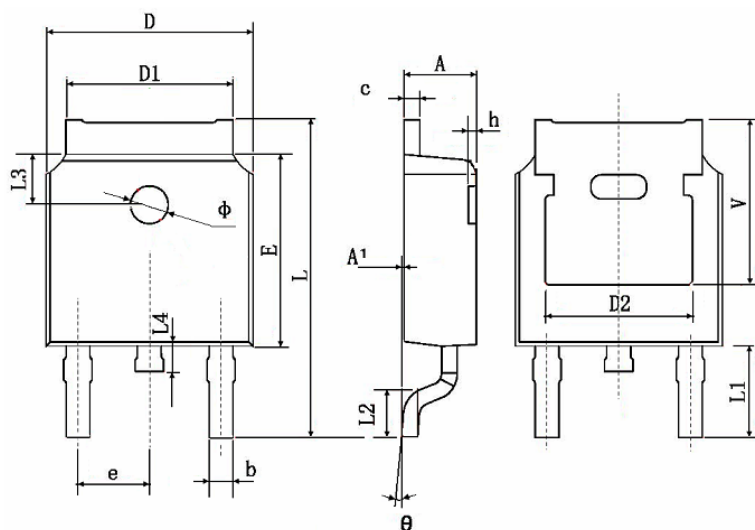
## Package Outline Dimension

TO-220



Symbol	Dimension In Millimeters			Dimension In Inches		
	Min	Nom	Max	Min	Nom	Max
A	4.400	4.550	4.700	0.173	0.179	0.185
A1	1.270	1.300	1.330	0.050	0.051	0.052
A2	2.590	2.690	2.790	0.102	0.106	0.110
b	0.770	-	0.900	0.030	-	0.035
b2	1.230	-	1.360	0.048	-	0.054
c	0.480	0.500	0.520	0.019	0.020	0.020
D	15.100	15.400	15.700	-	0.606	-
D1	9.000	9.100	9.200	0.354	0.358	0.362
DEP	0.050	0.285	0.520	0.002	0.011	0.020
E	10.060	10.160	10.260	0.396	0.400	0.404
E1	-	8.700	-	-	0.343	-
$\Phi P1$	1.400	1.500	1.600	0.055	0.059	0.063
e	2.54BSC			0.1BSC		
e1	5.08BSC			0.2BSC		
H1	6.100	6.300	6.500	0.240	0.248	0.256
L	12.750	12.960	13.170	0.502	0.510	0.519
L1	-	-	3.950	-	-	0.156
L2	1.85REF			0.073REF		
$\Phi P$	3.570	3.600	3.630	0.141	0.142	0.143
Q	2.730	2.800	2.870	0.107	0.110	0.113
Q1	-	0.200	-	-	0.008	-
$\Theta 1$	5°	7°	9°	5°	7°	9°
$\Theta 2$	1°	3°	5°	1°	3°	5°

## TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	0.483 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

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