

SE3060D

**N-Channel Enhancement-Mode MOSFET**

Revision: A

**General Description**

This type used advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of application

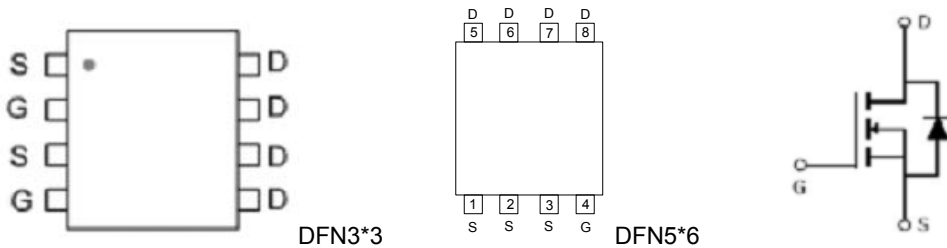
**Features**

For a single MOSFET

- $V_{DS} = 30V$
- $R_{DS(ON)} = 5.5m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} = 6m\Omega @ V_{GS}=5V$

**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	$I_D$	Continuous	60
		Pulsed	180
Total Power Dissipation	$P_D$	53	W
Derating factor		0.56	W/°C
Single pulse avalanche energy	$E_{AS}$	306	mJ
Operating Junction Temperature Range	$T_J$	-55 to 175	°C

**Thermal Resistance**

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

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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>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =25A	-	5.5	6.8	mΩ
		V <sub>GS</sub> =5V, I <sub>D</sub> =20A	-	6	9	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =24A	20			S
<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
<b>Source-Drain Diode Characteristics</b>						
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =24A			1.2	V
I <sub>S</sub>	Diode Forward Current				80	A
t <sub>rr</sub>	Reverse Recovery Time	T <sub>J</sub> =25°C, I <sub>F</sub> =80A Di/dt=100A/μs		32	50	nS
Q <sub>rr</sub>	Reverse Recovery Charge			12	20	nC
t <sub>on</sub>	Forward Turn-On Time	Intrinsic turn-on time is negligible(turn-on is dominated by LS)				

Typical Characteristics

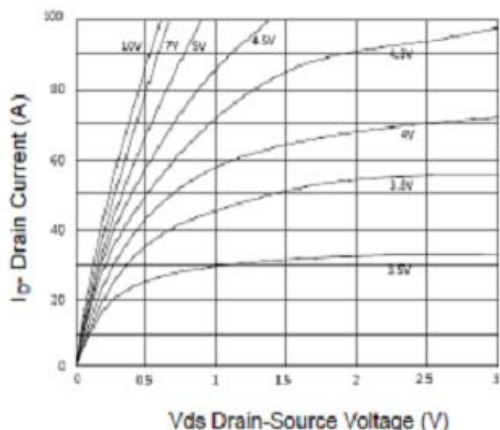


Figure 1 Output Characteristics

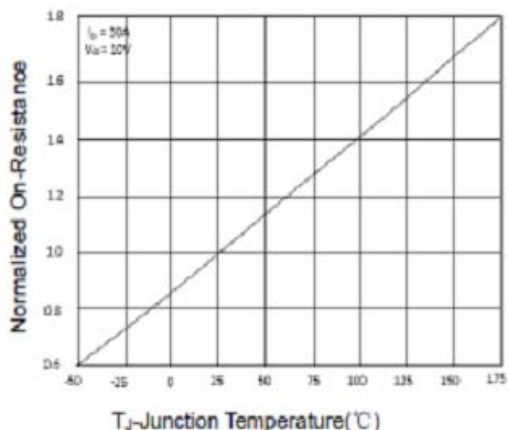


Figure 4 Rds(on)-Junction Temperature

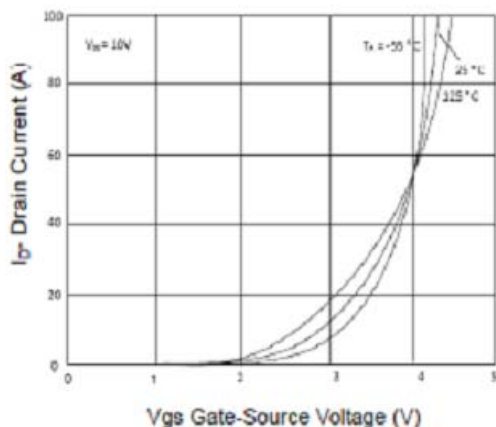


Figure 2 Transfer Characteristics

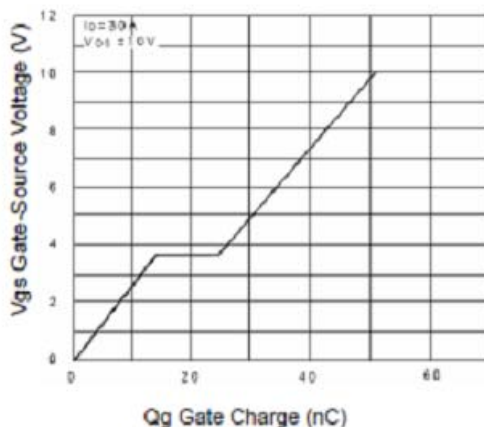


Figure 5 Gate Charge

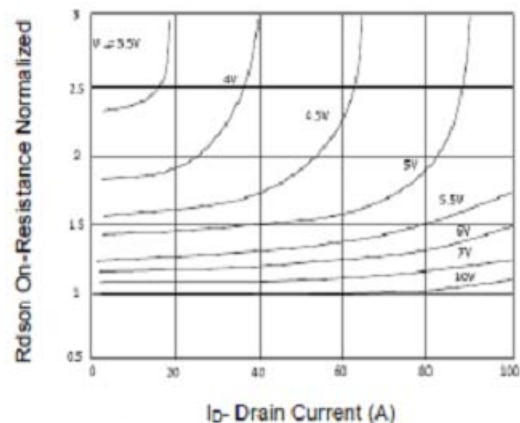


Figure 3 Rds(on)-Drain Current

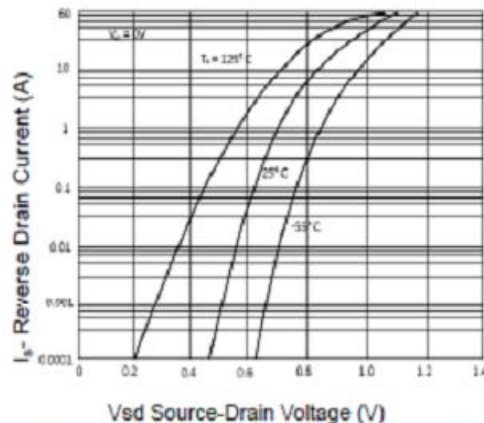


Figure 6 Source-Drain Diode Forward

Typical Characteristics

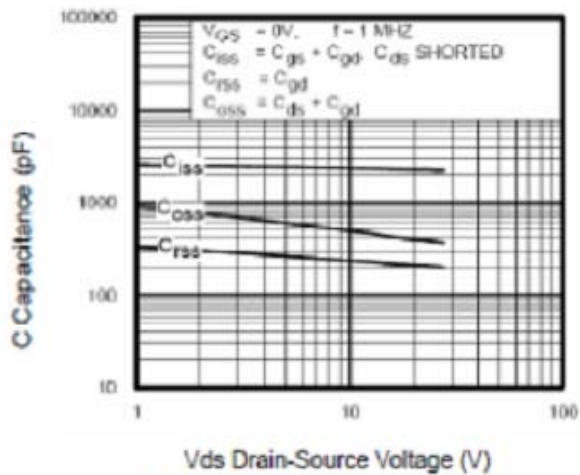


Figure 7 Capacitance vs Vds

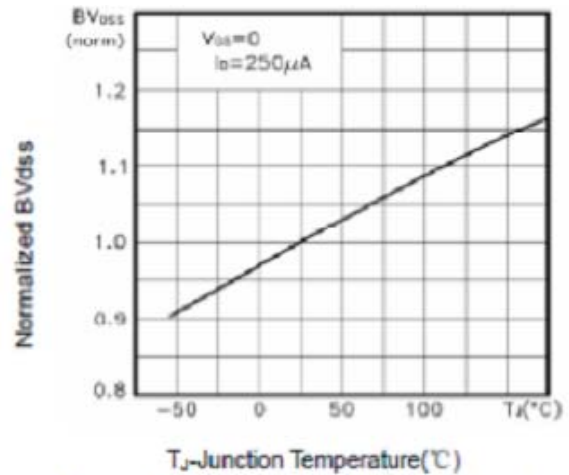


Figure 9 BVoss vs Junction Temperature

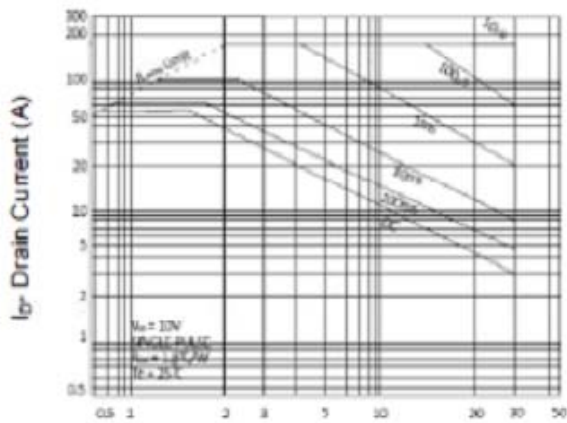


Figure 8 Safe Operation Area

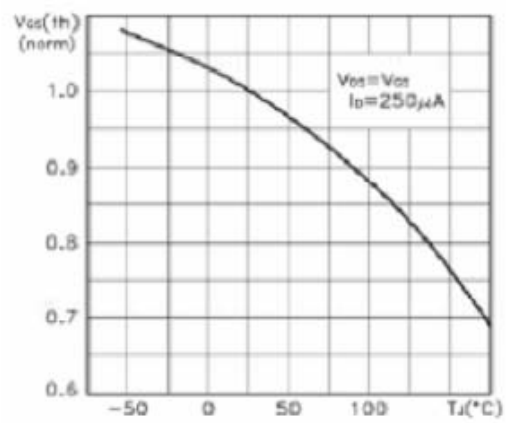


Figure 10 VGS(th) vs Junction Temperature

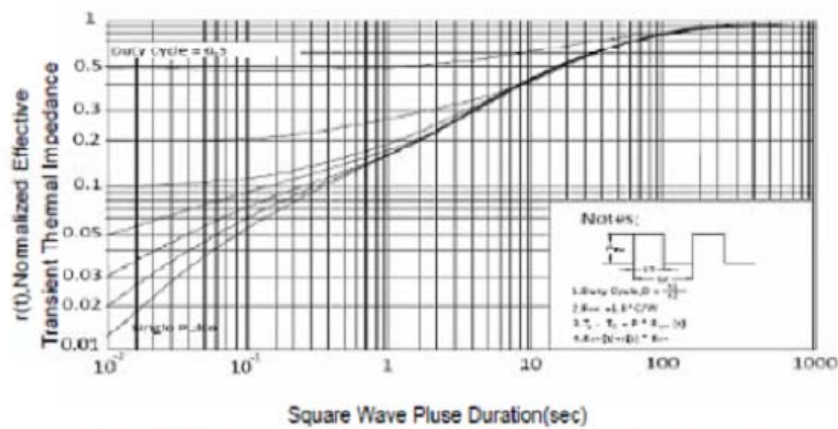
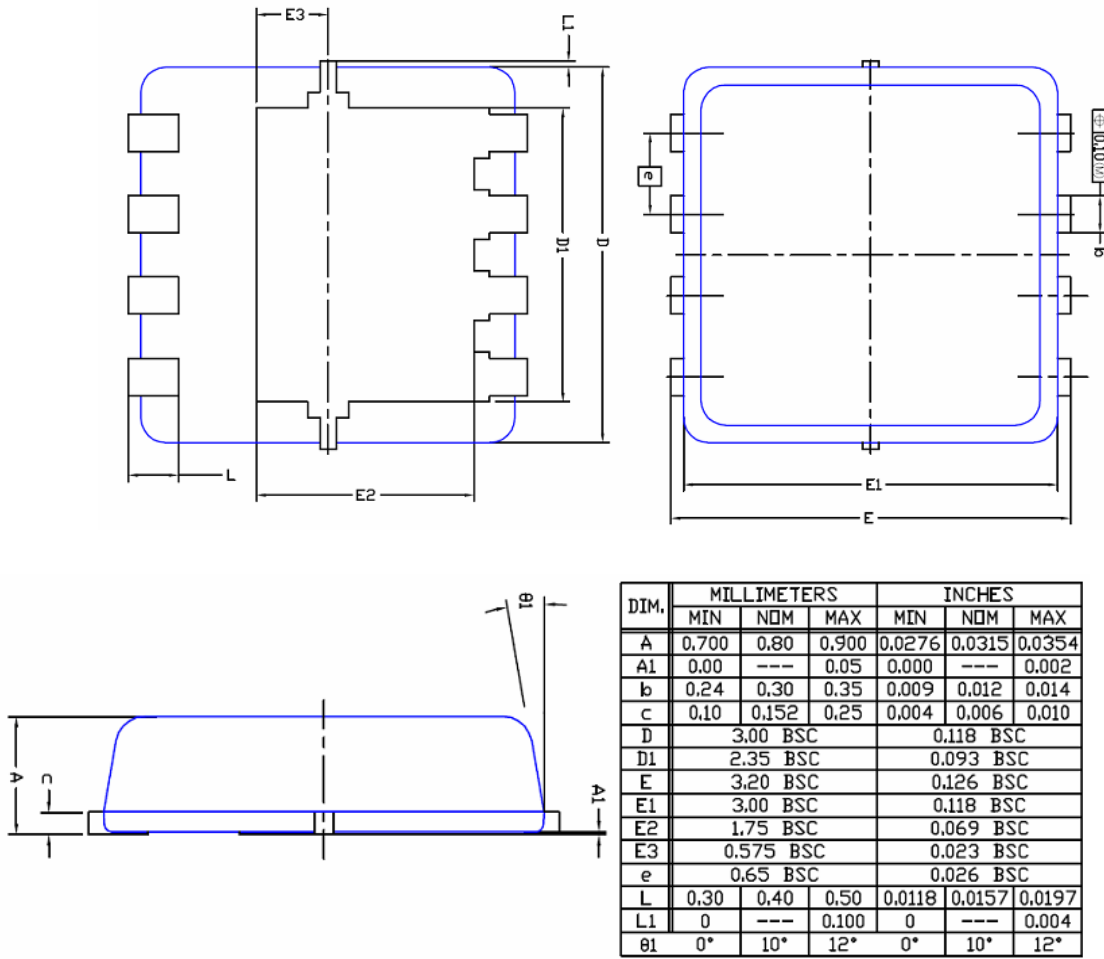


Figure 11 Normalized Maximum Transient Thermal Impedance

# SE3060D

## Package Outline Dimension

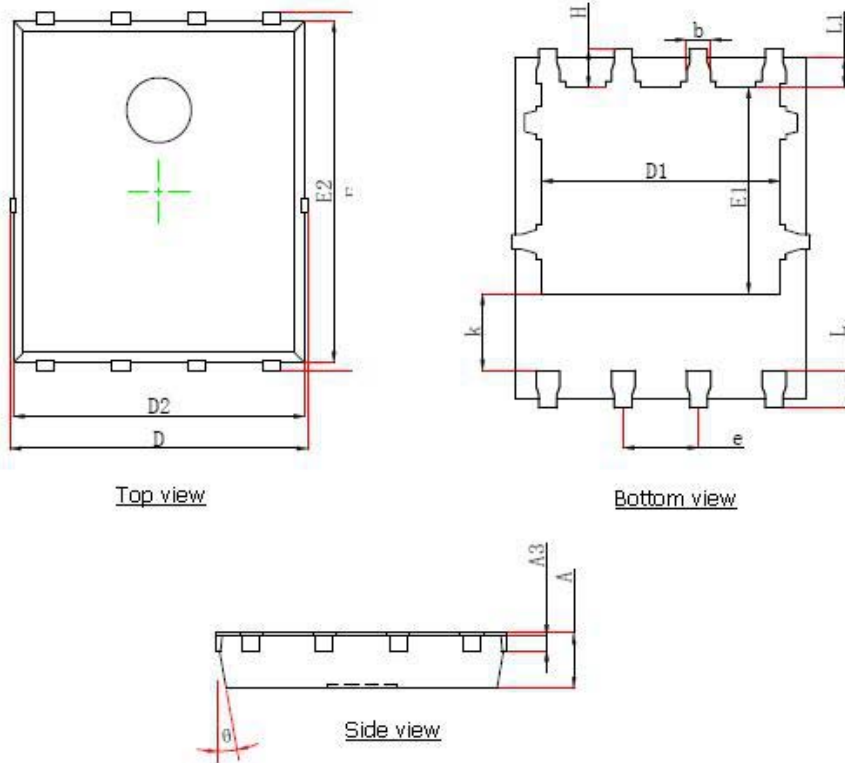
### DFN3X3



# SE3060D

## Package Outline Dimension

### DFN5X6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
$\theta$	10°	12°	10°	12°

**SE3060D**

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