

SE120120G

N-Channel Enhancement-Mode MOSFET

Revision: A

General Description

This device used advanced semiconductor technology and design to provide excellent $R_{DS(ON)}$ with low gate charge and low operation voltage. It can be used in wide variety of application

- Excellent package for superior thermal resistance
- Optimized technology for DC/DC converters
- Easy to use and parallel

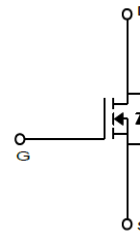
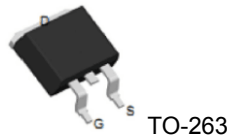
Features

For a single MOSFET

- $V_{DS} = 120V$
- $R_{DS(ON)} = 4.4m\Omega @ V_{GS}=10V$

Pin configurations

See Diagram below



Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	120	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous	I_D	129	A
	Pulsed		480	
Single Pulse Avalanche Energy		E_{AS}	1000	mJ
Total Power Dissipation	@TC=25°C	P_D	185	W
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($t \leq 10s$)	-	0.8	°C/W

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Electrical Characteristics (T _J =25°C unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS (Note 2)						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0 V	120			V
I _{DSS}	Drain to Source Leakage Current	V _{DS} =120V, V _{GS} =0V			1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =20V			100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250μA	2.5	3.3	4.5	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =60A	-	4.4	6.1	mΩ
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =60A	60			S
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =50V, f=1MHz		5600		pF
C _{oss}	Output Capacitance			641		pF
C _{rss}	Reverse Transfer Capacitance			28		pF
SWITCHING PARAMETERS						
Q _g	Total Gate Charge ²	V _{GS} =10V, V _{DS} =60V, I _D =60A		84.7		nC
Q _{gs}	Gate Source Charge			30.6		nC
Q _{gd}	Gate Drain Charge			18.3		nC
t _{d(on)}	Turn-On Delay Time	V _{GS} =10V, V _{DS} =60, I _D =60A		16		ns
t _{d(off)}	Turn-Off Delay Time			45		ns
t _{d(r)}	Turn-On Rise Time			67		ns
t _{d(f)}	Turn-Off Fall Time			14		ns
Source-Drain Ratings and Characteristics						
I _S	Diode Forward Current				129	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =129A			1.2	V
t _{rr}	Reverse Recovery Time	T _J =25°C, I _F =I _S		60		ns
Q _{rr}	Reverse Recovery Charge	Di/dt=100A/μs		140		nC

Typical Characteristics

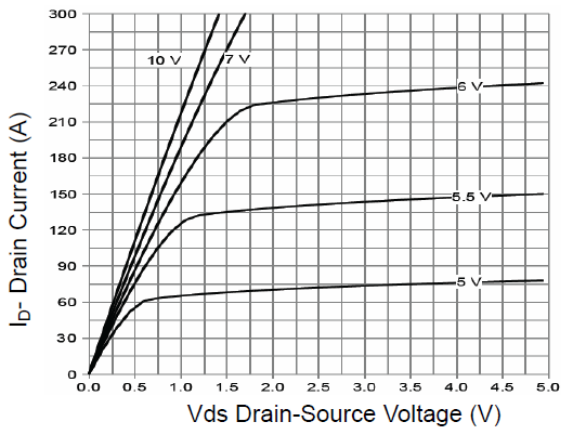


Figure 1 Output Characteristics

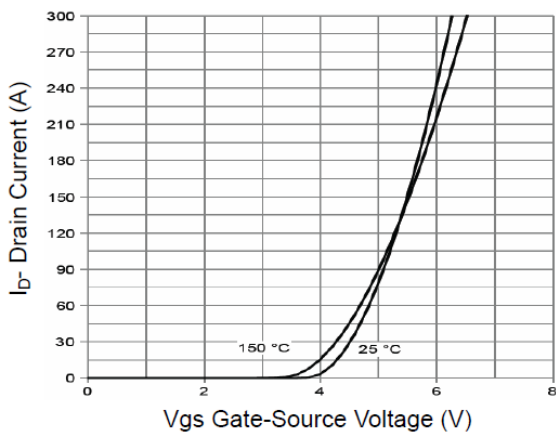


Figure 2 Transfer Characteristics

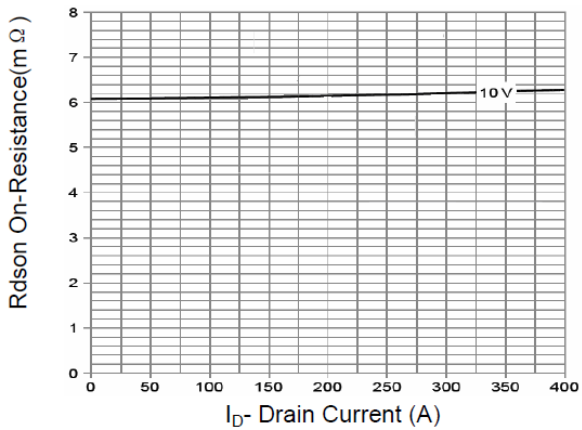


Figure 3 Rdson- Drain Current

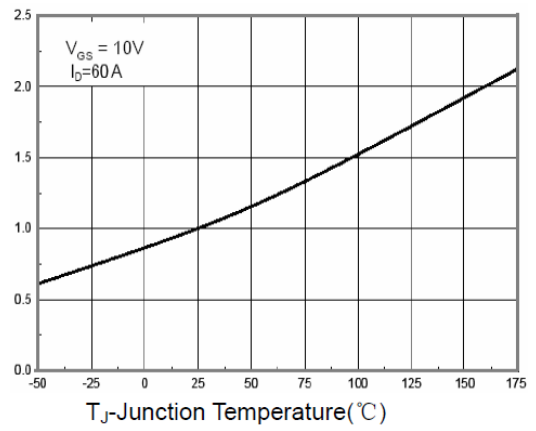


Figure 4 Rdson-Junction Temperature

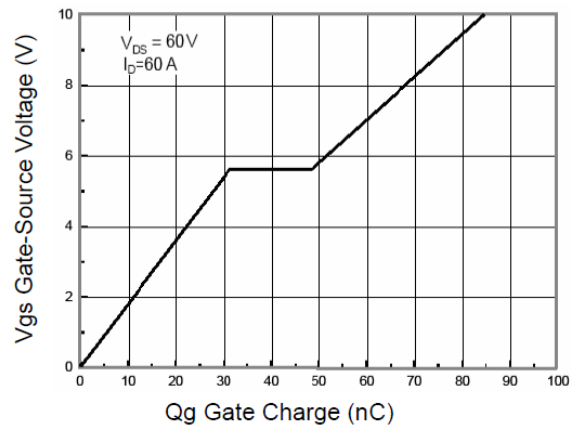


Figure 5 Gate Charge

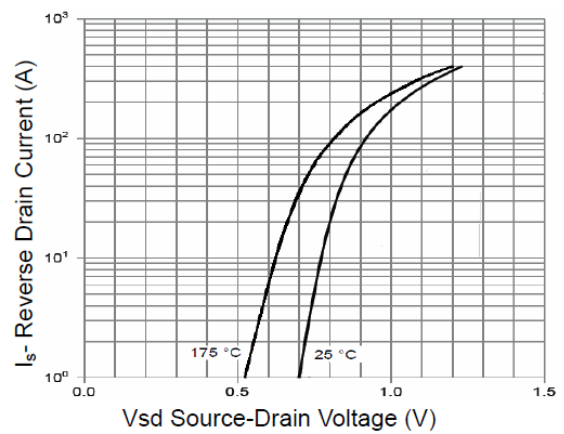


Figure 6 Source- Drain Diode Forward

Typical Characteristics

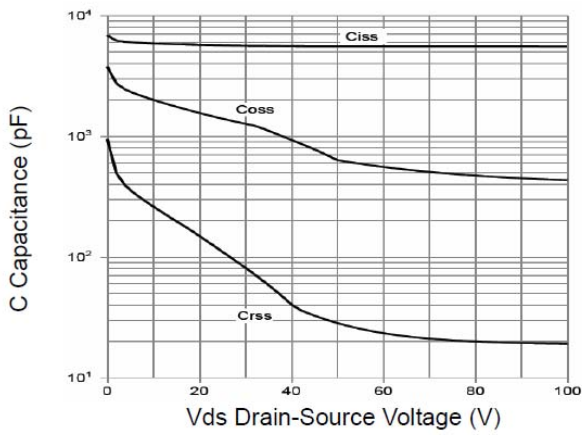


Figure 7 Capacitance vs Vds

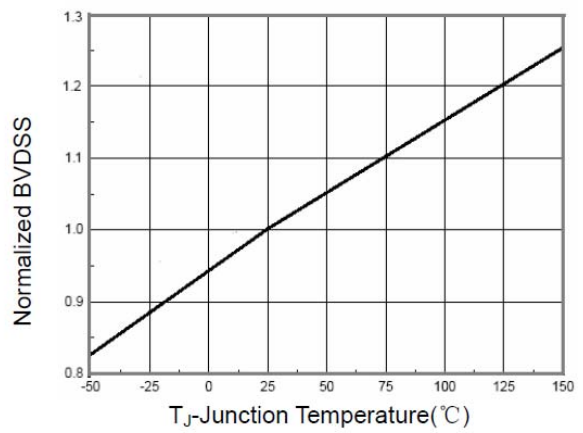


Figure 9 BV_{DSS} vs Junction Temperature

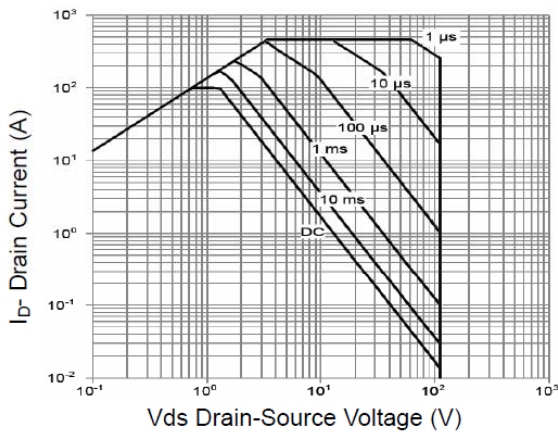


Figure 8 Safe Operation Area

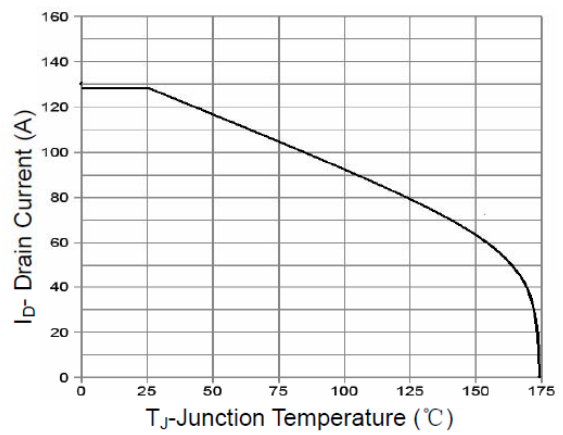


Figure 10 Current De-rating

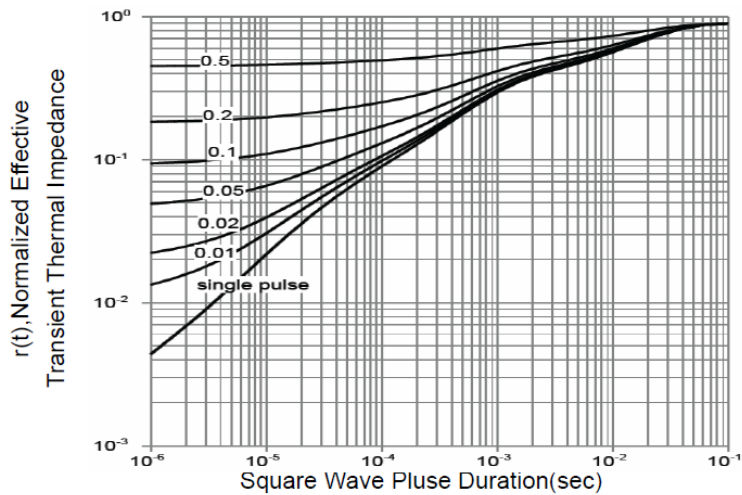
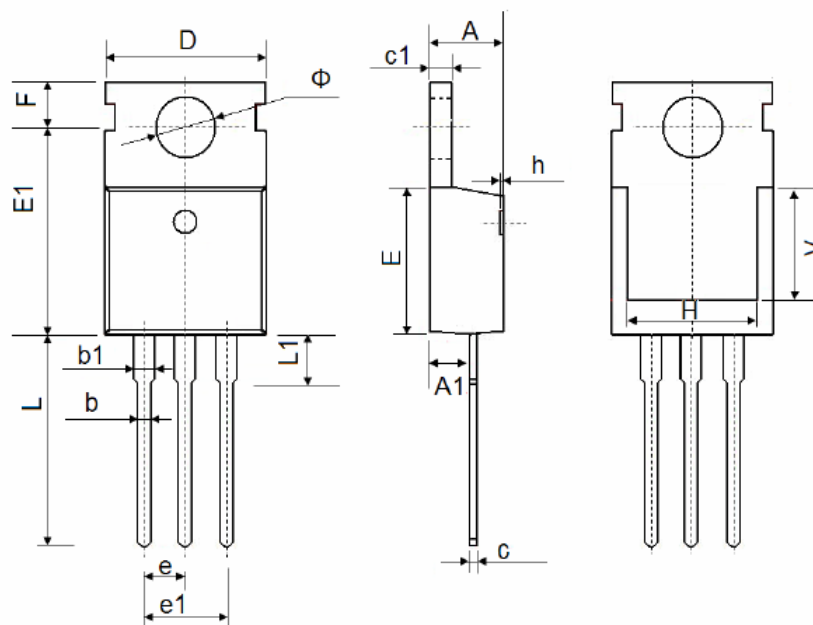


Figure 11 Normalized Maximum Transient Thermal Impedance

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Package Outline Dimension

TO-220

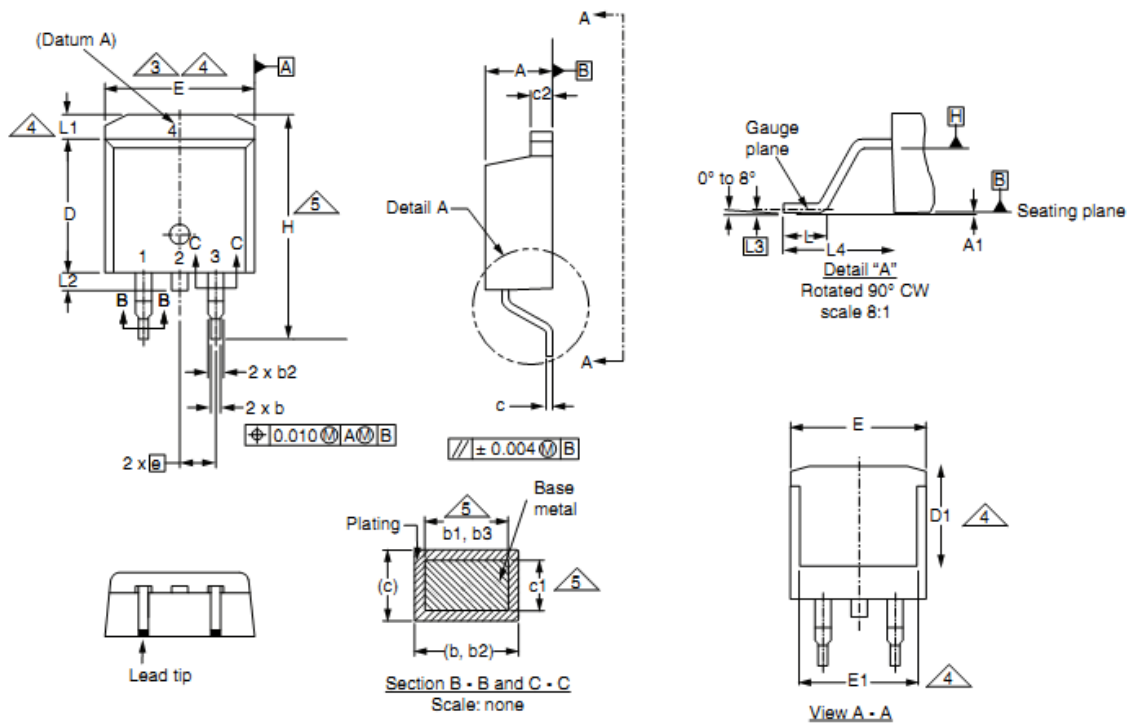


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
Φ	3.400	3.800	0.134	0.150

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Package Outline Dimension

TO-263



DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.06	4.83	0.160	0.190
A1	0.00	0.25	0.000	0.010
b	0.51	0.99	0.020	0.039
b1	0.51	0.89	0.020	0.035
b2	1.14	1.78	0.045	0.070
b3	1.14	1.73	0.045	0.068
c	0.38	0.74	0.015	0.029
c1	0.38	0.58	0.015	0.023
c2	1.14	1.65	0.045	0.065
D	8.38	9.65	0.330	0.380

DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
D1	6.86	-	0.270	-
E	9.65	10.67	0.380	0.420
E1	6.22	-	0.245	-
e	2.54 BSC		0.100 BSC	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	-	1.65	-	0.066
L2	-	1.78	-	0.070
L3	0.25 BSC		0.010 BSC	
L4	4.78	5.28	0.188	0.208

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