SHANGHAI SINO-IC
MICROELECTRONICS CO., LTD.

SE120120G

N-Channel Enhancement-Mode MOSFET

Revision: A

General Description

This device used advanced semiconductor technology and design to provide excellent RDS(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

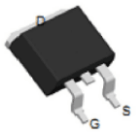
Features

For a single MOSFET

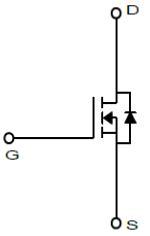
- V_{DS} = 120V
- $R_{DS(ON)}$ = 4.4mΩ @ V_{GS}=10V

Pin configurations

See Diagram below



TO-263



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℃	P_D	185	W
Operating Junction Temperature Range		T_J	-55 to 175	℃

Thermal Resistance

Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance Junction to Case(t≤10s)	-	0.8	℃/W

Electrical Characteristics (TJ=25℃ 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
trr	Reverse Recovery Time	TJ=25℃, IF=IS Di/dt=100A/μs		60		ns
Qrr	Reverse Recovery Charge			140		nC

Typical Characteristics

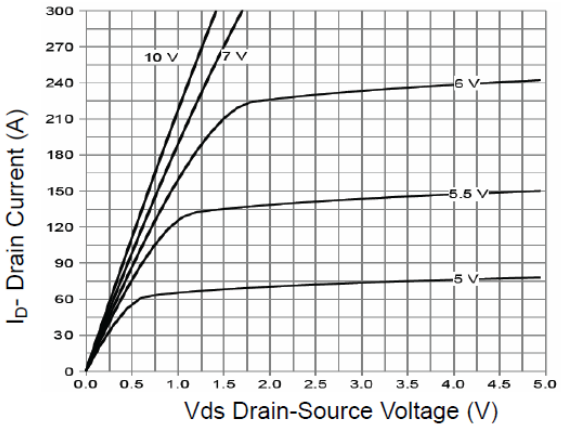


Figure 1 Output Characteristics

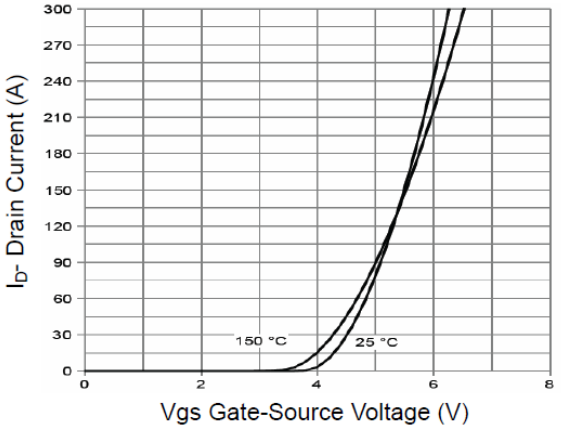


Figure 2 Transfer Characteristics

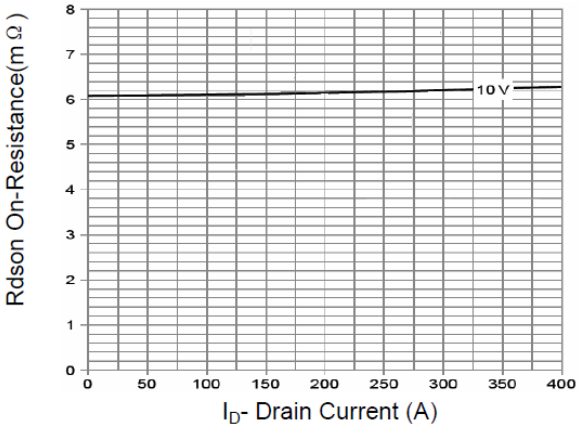


Figure 3 Rdson- Drain Current

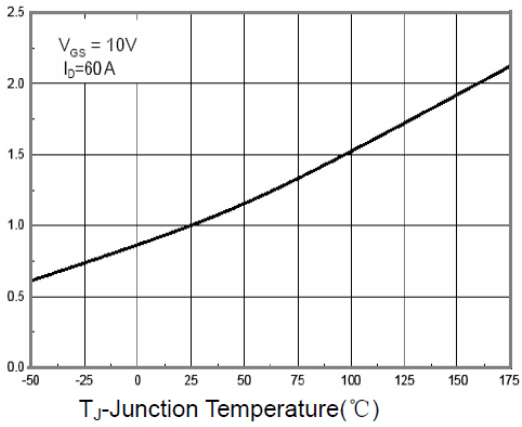


Figure 4 Rdson-JunctionTemperature

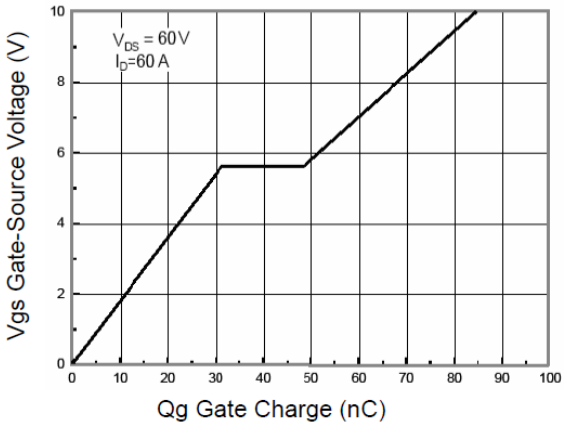


Figure 5 Gate Charge

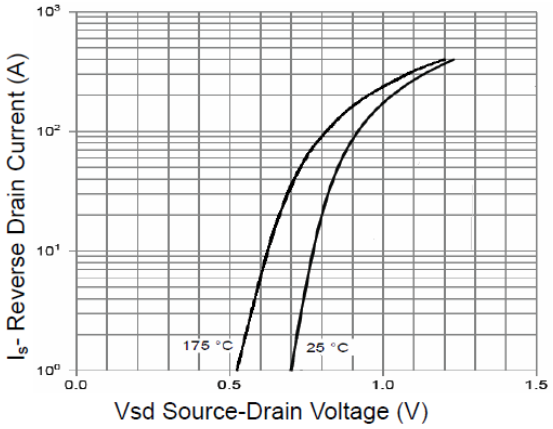


Figure 6 Source- Drain Diode Forward

Typical Characteristics

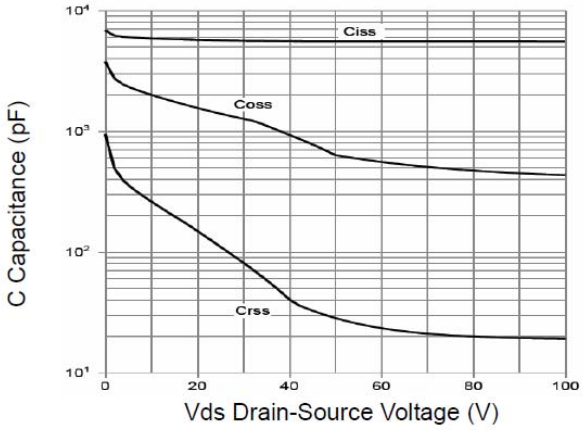


Figure 7 Capacitance vs Vds

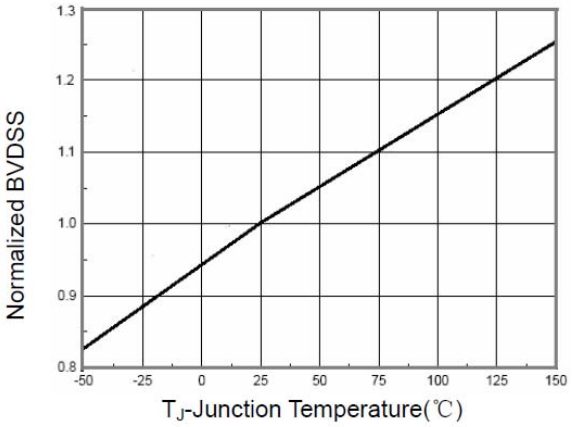


Figure 9 BV_{DSS} vs Junction Temperature

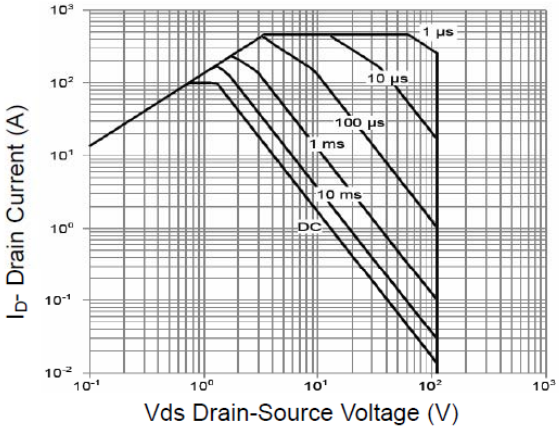


Figure 8 Safe Operation Area

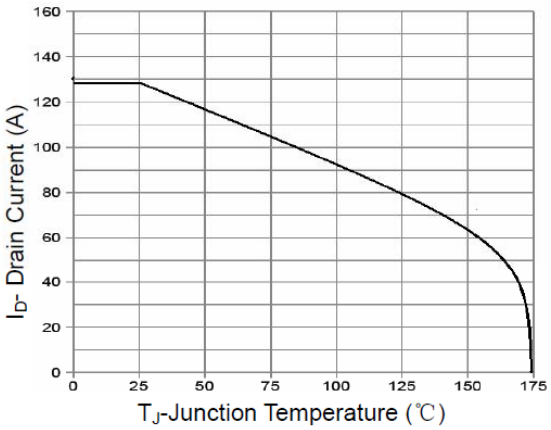


Figure 10 Current De-rating

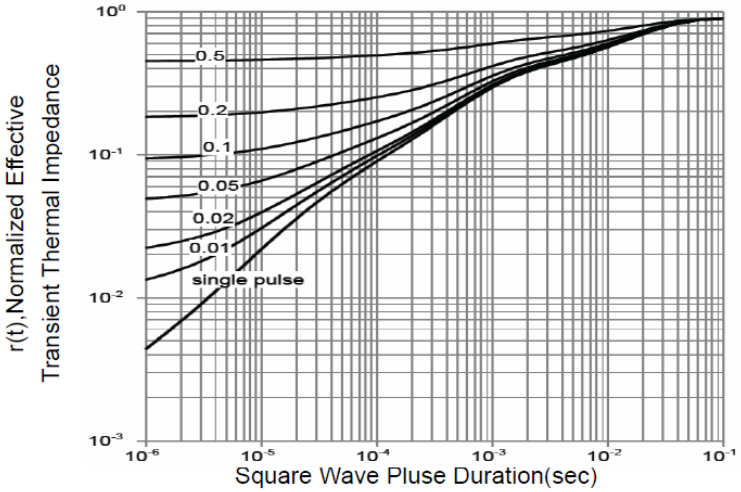
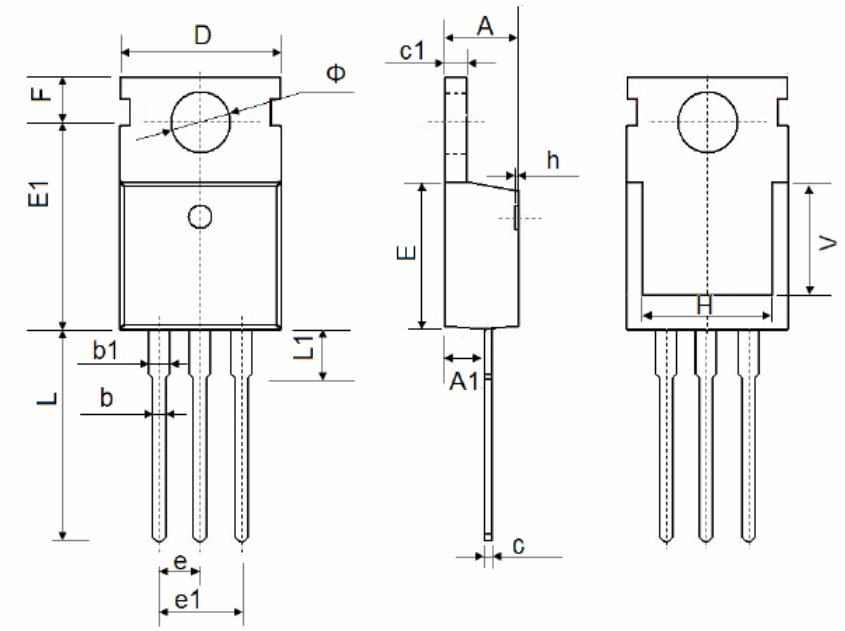


Figure 11 Normalized Maximum Transient Thermal Impedance

Package Outline Dimension

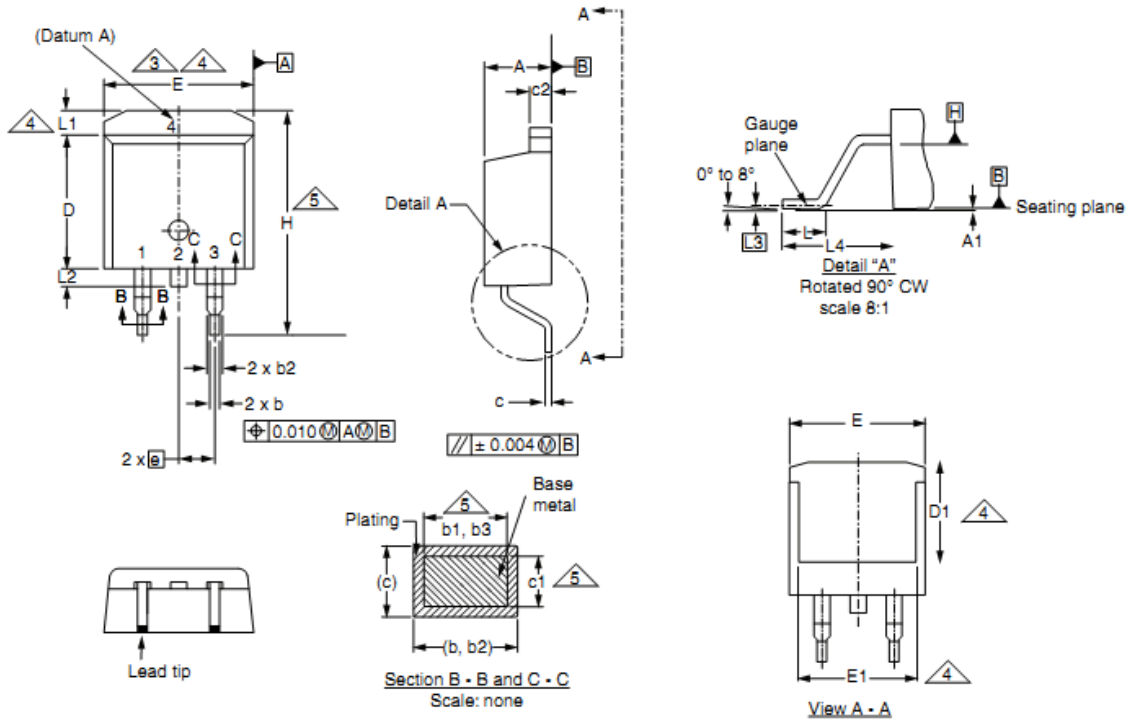
TO-220



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

Package Outline Dimension

TO-263



	MILLIMETERS		INCHES	
DIM.	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

	MILLIMETERS		INCHES	
DIM.	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

SHANGHAI SINO-IC MICROELECTRONICS CO., LTD

Add: Building 3, Room 3401-03, No.200 Zhangheng Road, ZhangJiang Hi-Tech Park, Pudong, Shanghai 201203, China
Phone: +86-21-33932402 33932403 33932405 33933508 33933608
Fax: +86-21-33932401
Email: webmaster@sino-ic.net
Website: http://www.sino-ic.net