SHANGHAI SINO-IC
MICROELECTRONICS CO., LTD.

SE60210GA
N-Channel Enhancement-Mode MOSFET

Revision: A

General Description

This type used advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge.

l   High density cell design for ultra low $R_{DS(ON)}$

l   Excellent package for good heat dissipation

Features

For a single MOSFET

l V_{DS} = 60V

l $R_{DS(ON)}$ = 2.2mΩ @ V_{GS}=10V

l

Pin configurations

See Diagram below

Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	$\pm$20	V
Drain Current	Continuous	I_D	210	A
	Pulsed		800	
Total Power Dissipation	@TA=25℃	P_D	300	W
Operating Junction Temperature Range		T_J	-55 to 175	℃

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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	60			V
I_{DSS}	Drain to Source Leakage Current	V_{DS}= 48V, 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	2.0	3.0	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=20A		2.2	2.6	mΩ
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V, f=1MHz		7070		pF
C_{oss}	Output Capacitance			2140		pF
C_{rss}	Reverse Transfer Capacitance			63		pF
SWITCHING PARAMETERS						
Q_g	Total Gate Charge [2]	V_{GS}=10V, V_{DS}=30V, I_D=20A		85		nC
Q_{gs}	Gate Source Charge			24		nC
Q_{gd}	Gate Drain Charge			14		nC
$t_{d(on)}$	Turn-On Delay Time	V_{GS}=10V, V_{DS}=30V, R_{GEN}=10Ω		36		ns
$t_{d(off)}$	Turn-Off Delay Time			95		ns
$t_{d(r)}$	Turn-On Rise Time			62		ns
$t_{d(f)}$	Turn-Off Fall Time			34		ns

Thermal Resistance			
Symbol	Parameter	Typ	Units
$R_{\theta JC}$	Junction to Case	0.5	℃/W

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Typical Characteristics
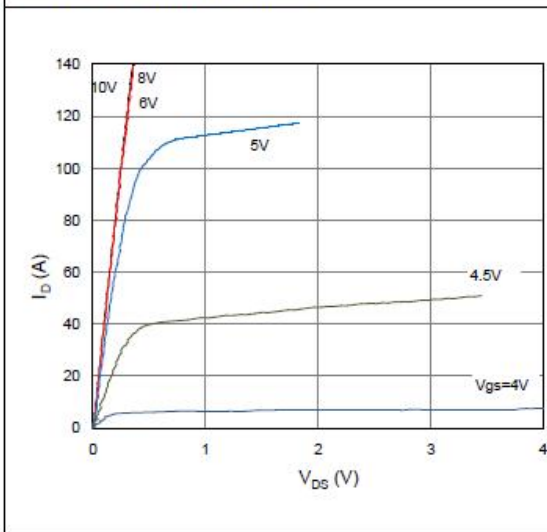
Fig 1. Typical Output Characteristics

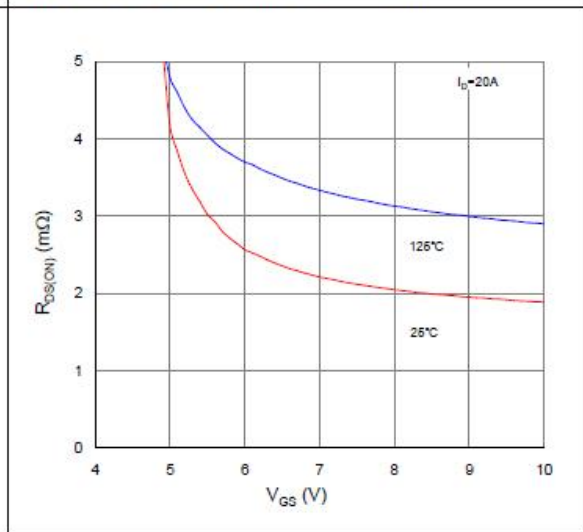Figure 2. On-Resistance vs. Gate-Source Voltage

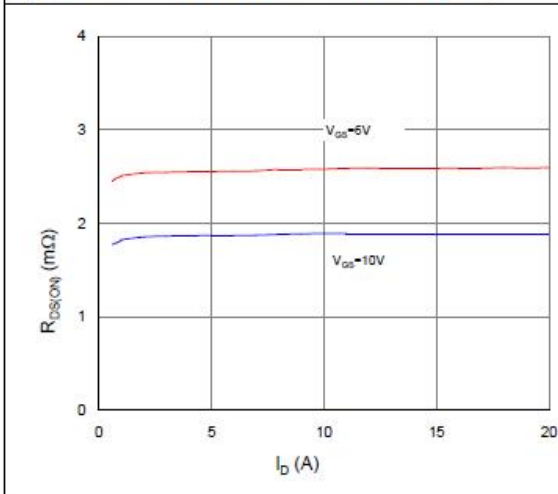Figure 3. On-Resistance vs. Drain Current and Gate Voltage

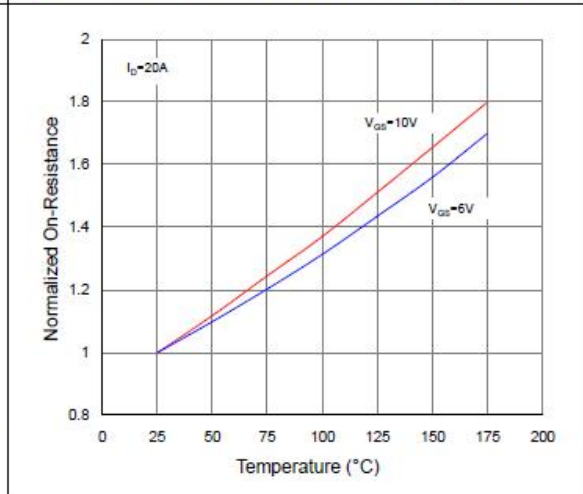Figure 4. Normalized On-Resistance vs. Junction Temperature
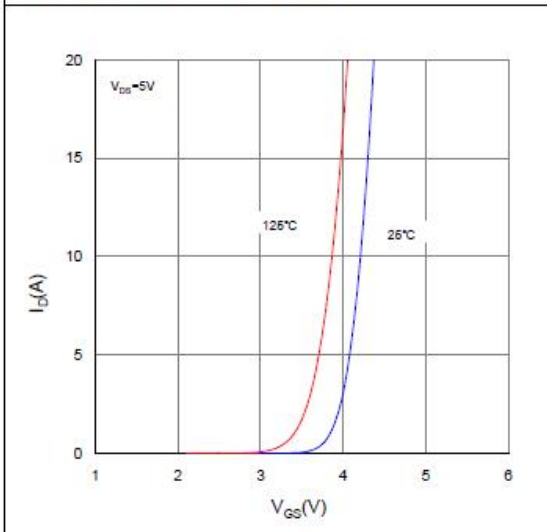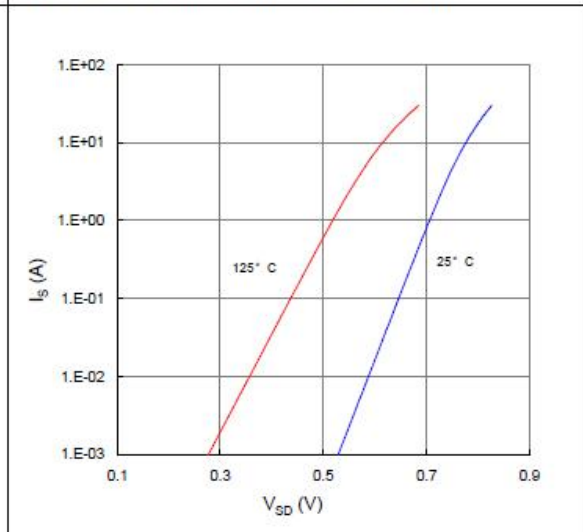
Figure 5. Typical Transfer Characteristics

Figure 6. Typical Source-Drain Diode Forward Voltage

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Typical Characteristics

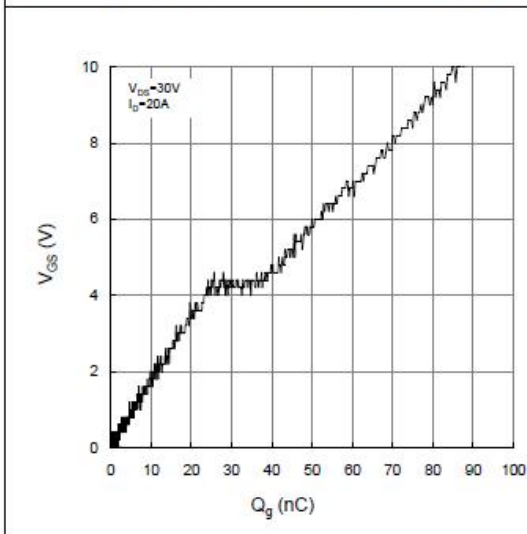Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

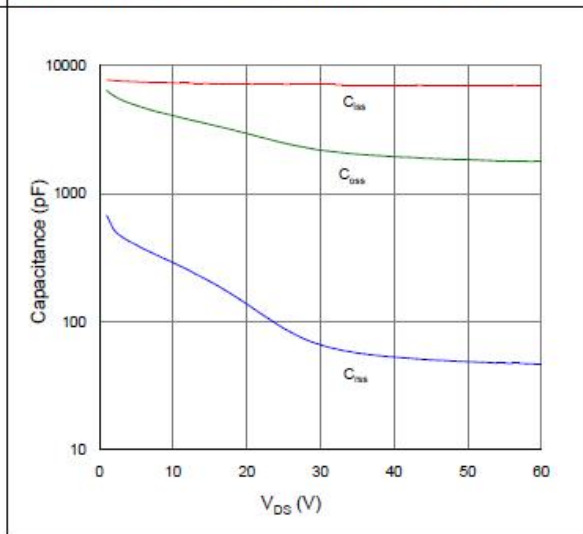Figure 8. Typical Capacitance vs. Drain-to-Source Voltage
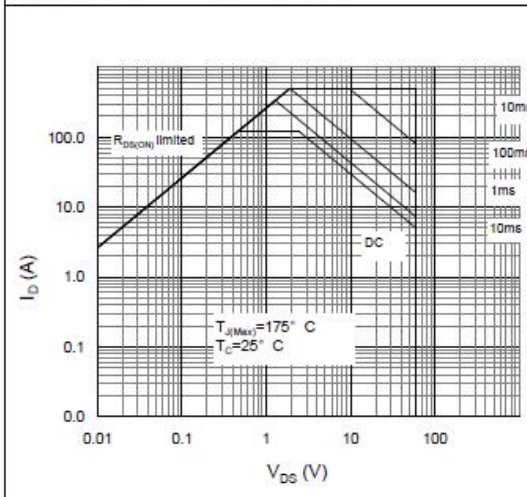
Figure 9. Maximum Safe Operating Area

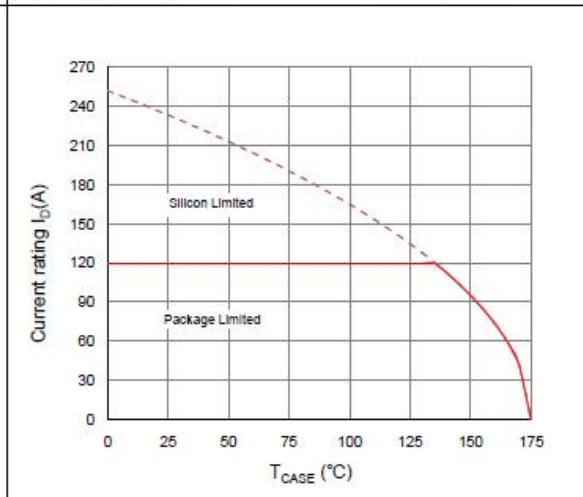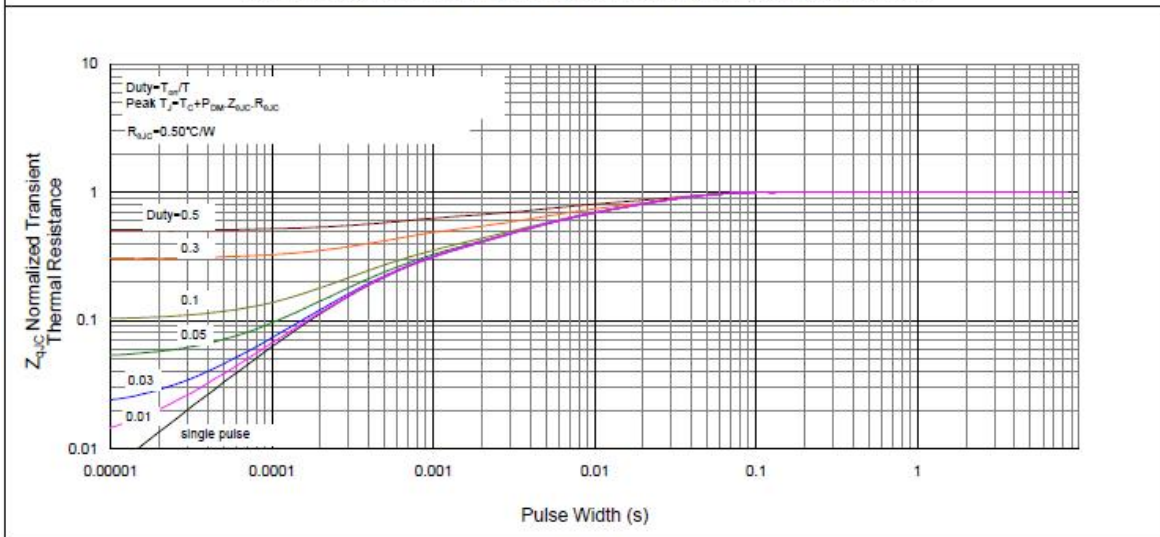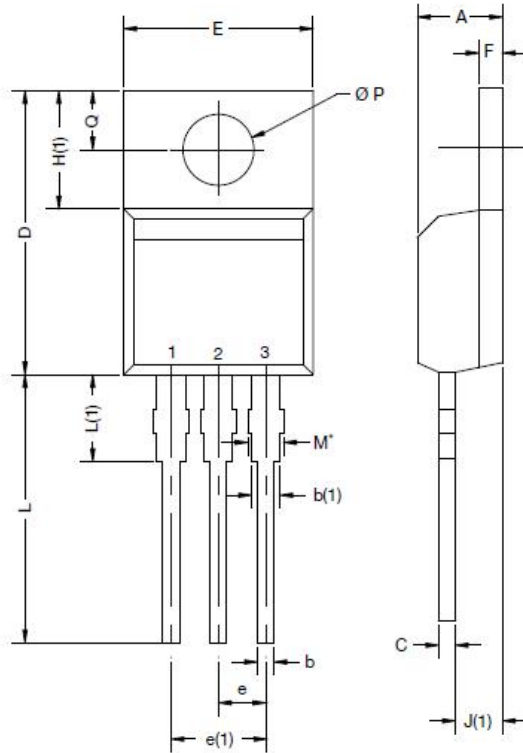Figure 10. Maximun Drain Current vs. Case Temperature

Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

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Package Outline Dimension

TO-220

DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.24	4.65	0.167	0.183
b	0.69	1.02	0.027	0.040
b(1)	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.33	15.85	0.564	0.624
E	9.96	10.52	0.392	0.414
e	2.41	2.67	0.095	0.105
e(1)	4.88	5.28	0.192	0.208
F	1.14	1.40	0.045	0.055
H(1)	6.10	6.71	0.240	0.264
J(1)	2.41	2.92	0.095	0.115
L	13.36	14.40	0.526	0.567
L(1)	3.33	4.04	0.131	0.159
Ø P	3.53	3.94	0.139	0.155
Q	2.54	3.00	0.100	0.118

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