SHANGHAI SINO-IC MICROELECTRONICS CO., LTD.

Sep 2015

SE4060TF

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.

- High density cell design for ultra low $R_{DS(ON)}$
- Excellent package for good heat dissipation
- Special technology for high ESD capability

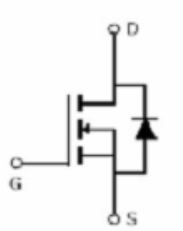
Features

For a single MOSFET

- V_{DS} = 40V
- $R_{DS(ON)}$ < 8mΩ @ V_{GS}=10V

Pin configurations

See Diagram below



Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current	Continuous	I_D	50	A
	Pulsed		100	
Total Power Dissipation	@TA=25℃	P_D	32	W
Operating Junction Temperature Range		T_J	-55 to 150	℃

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	40			V
I_{DSS}	Drain to Source Leakage Current	V_{DS}= 32V, V_{GS}=0V			1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=20 V			100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	1.0	1.7	3.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance [2]	V_{GS}=10V, I_D=14A		6.1	8.0	mΩ
		V_{GS}=4.5V, I_D=11A		8.2	10.5	mΩ
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=20V, f=1MHz		1480		pF
C_{oss}	Output Capacitance			113		pF
C_{rss}	Reverse Transfer Capacitance			243		pF
SWITCHING PARAMETERS						
Q_g	Total Gate Charge [2]	V_{GS}=10V, V_{DS}=20V, I_D=14A		26.4		nC
Q_{gs}	Gate Source Charge			3.6		nC
Q_{gd}	Gate Drain Charge			6.8		nC
$t_{d(on)}$	Turn-On Delay Time	V_{GS}=10V, V_{DS}=20V, R_{GEN}=6Ω I_D=1A		9		ns
$t_{d(off)}$	Turn-Off Delay Time			31		ns
$t_{d(r)}$	Turn-On Rise Time			21		ns
$t_{d(f)}$	Turn-Off Fall Time			18		ns

Thermal Resistance

Symbol	**Parameter**	**Min**	**Typ**	**Units**
$R_{\theta JC}$	Junction to Case		3.9	℃/W

Typical Characteristics

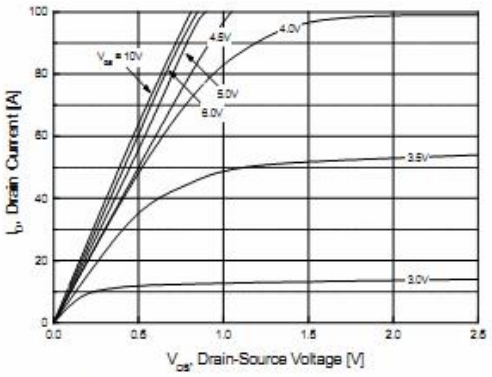


Fig.1 On-Region Characteristics

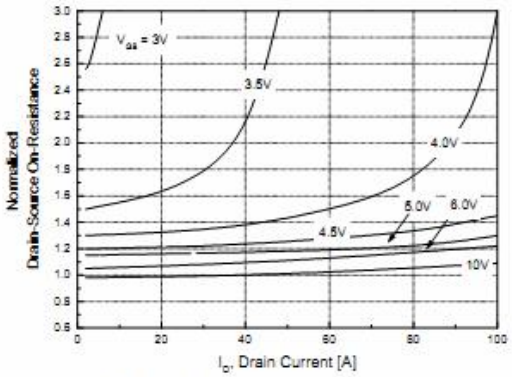


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

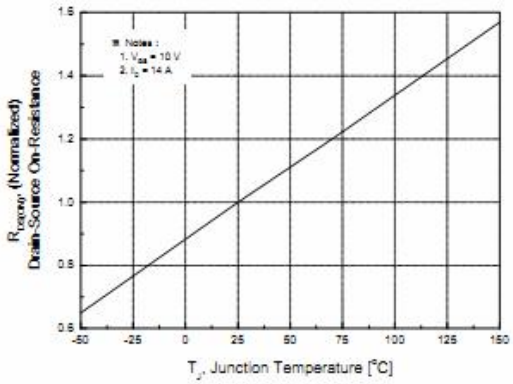


Fig.3 On-Resistance Variation with Temperature

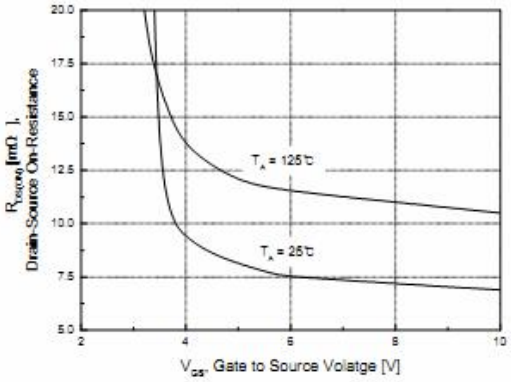


Fig.4 On-Resistance Variation with Gate to Source Voltage

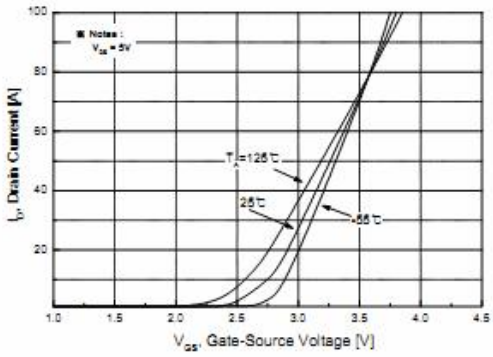


Fig.5 Transfer Characteristics

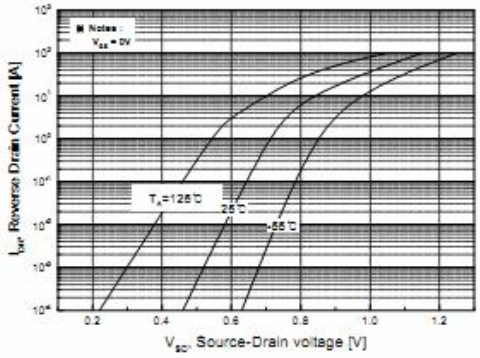


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

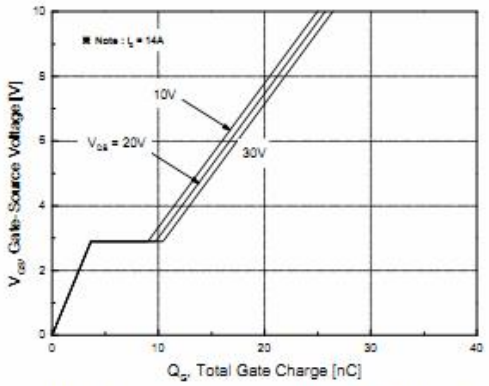


Fig.7 Gate Charge Characteristics

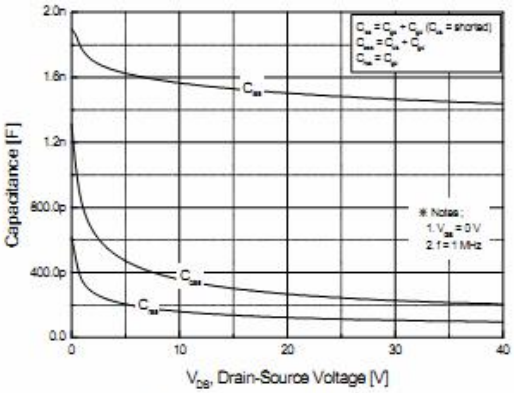


Fig.8 Capacitance Characteristics

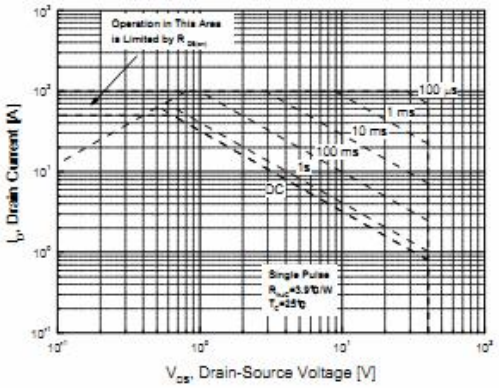


Fig.9 Maximum Safe Operating

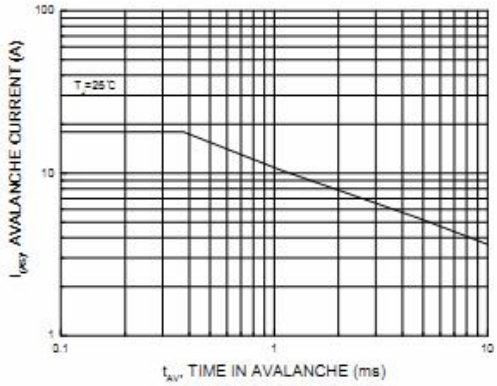


Fig.10 Unclamped Inductive Switching Capability

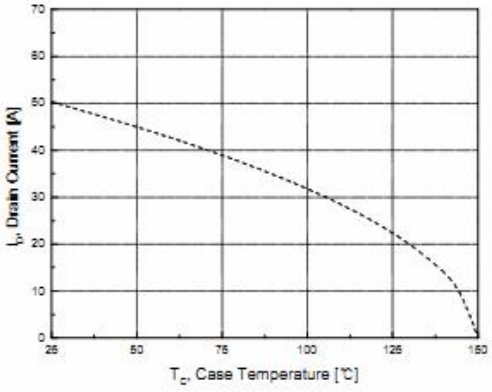


Fig.11 Maximum Drain Current Vs. Case Temperature

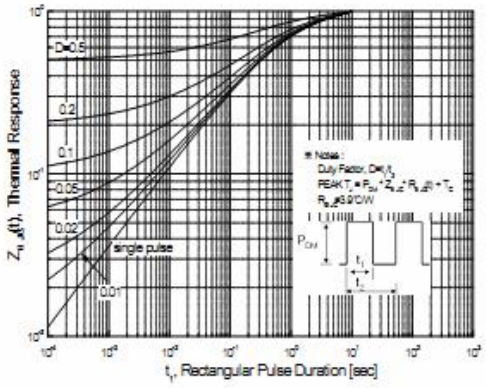
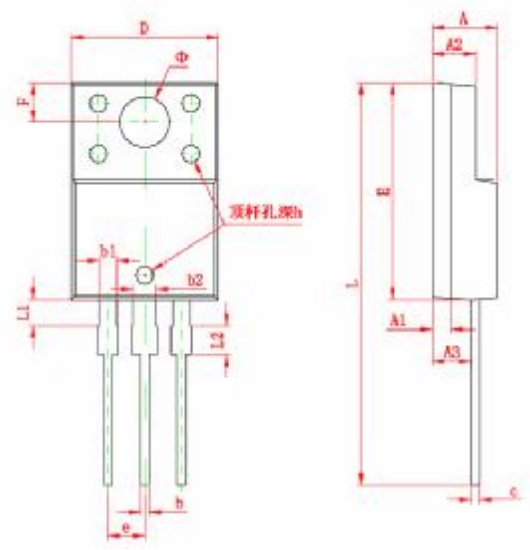


Fig.12 Transient Thermal Response Curve

Package Outline Dimension

TO-220



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.300	4.700	0.169	0.185
A1	1.300 REF		0.051 REF	
A2	2.800	3.200	0.110	0.126
A3	2.500	2.900	0.098	0.114
b	0.500	0.750	0.020	0.030
b1	1.100	1.350	0.043	0.053
b2	1.500	1.750	0.059	0.069
c	0.500	0.750	0.020	0.030
D	9.960	10.360	0.392	0.408
E	14.800	15.200	0.583	0.598
e	2.540 TYP		0.100 TYP	
F	2.700 REF		0.106 REF	
Φ	3.500 REF		0.138 REF	
h	0.000	0.300	0.000	0.012
L	28.000	28.400	1.102	1.118
L1	1.700	1.900	0.067	0.075
L2	1.900	2.100	0.075	0.083

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