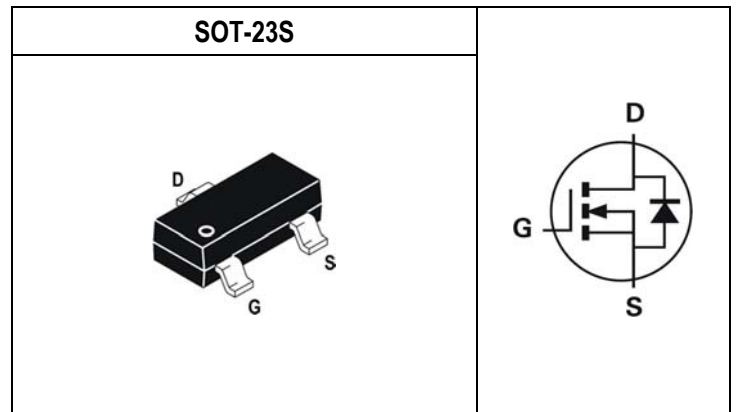


Parameter	Value	Unit
V_{DSS}	30	V
$R_{DS(ON) \max.} V_{GS}=10V$	38	m Ω
$R_{DS(ON) \max.} V_{GS}=4.5V$	46	m Ω
$R_{DS(ON) \max.} V_{GS}=2.5V$	60	m Ω
I_D	4.8	A
Q_g	5.3	nC
Q_{gd}	1.5	nC
Q_{sw}	2	nC



Features	Application
<ul style="list-style-type: none"> • Low On-Resistance • Low Input Capacitance • Low Miller Charge • Fully Characterized Capacitance and Avalanche • Pb-free lead plating; RoHS compliant 	<ul style="list-style-type: none"> • Motor / Body Load Control • Automotive Systems • Load Switch • DC-DC converters and Off-line UPS

Ordering Information

Ordering Code	RoHS Status	Package	Package Code	Packing	Quantity
SGN3055V	Halogen-Free	SOT-23S	V	Tape & Reel	3,000

Absolute Maximum Ratings ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous ^{Note 1}	$T_A=25^\circ\text{C}$	4.8	A
	$T_A=70^\circ\text{C}$	3.9	A
Drain Current-Pulsed ^{Note 2}	$T_A=25^\circ\text{C}$	19.2	A
Avalanche Current	I_{AR}	10	A
Single Pulse Avalanche Energy ^{Note 3}	E_{AS}	5	mJ
Maximum Power Dissipation	$T_A=25^\circ\text{C}$	1.4	W
	$T_A=70^\circ\text{C}$	0.9	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Resistance Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Thermal resistance, Junction-to-Ambient ^{Note 4}	$R_{\theta JA}$	Steady State	-	-	87.97	$^\circ\text{C/W}$
Thermal resistance, Junction-to-Case ^{Note 4}	$R_{\theta JC}$	Steady State	-	-	29.25	$^\circ\text{C/W}$

Notes:

- Limited by silicon chip capability and junction-to-ambient thermal resistance.
- Must be ensure junction temperature does not exceed 150-degree C. (Pulse Width $\leq 100\mu\text{s}$, Duty $\leq 2\%$)
- Limited by $T_{J\max}$, starting $T_J=25^\circ\text{C}$, $L=0.1\text{mH}$, $R_g=25\Omega$, $I_D=10\text{A}$, $V_{GS}=10\text{V}$.
- $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta JA}$ is determined by the user's board design. $R_{\theta JA}$ shown below for single device operation on FR-4 in still air.

Electrical Characteristics (T_J=25°C unless otherwise noted)

STATIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	1	μA
		V _{DS} =30V, V _{GS} =0V, T _J =125°C	-	-	100	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA

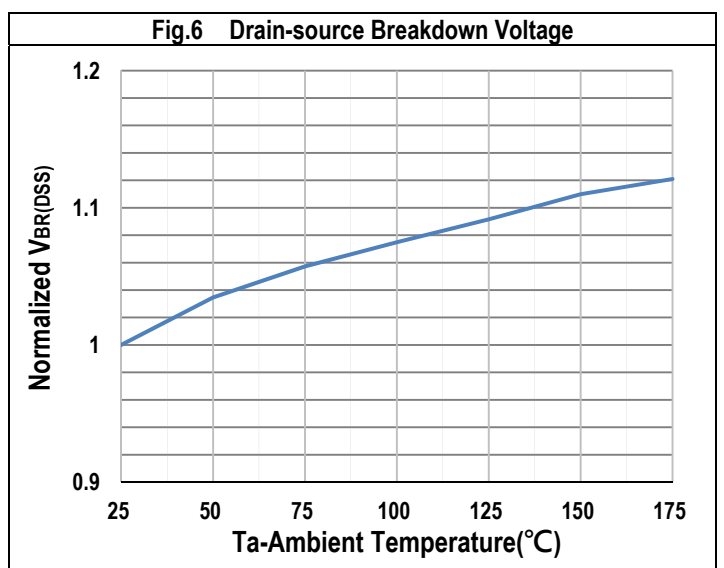
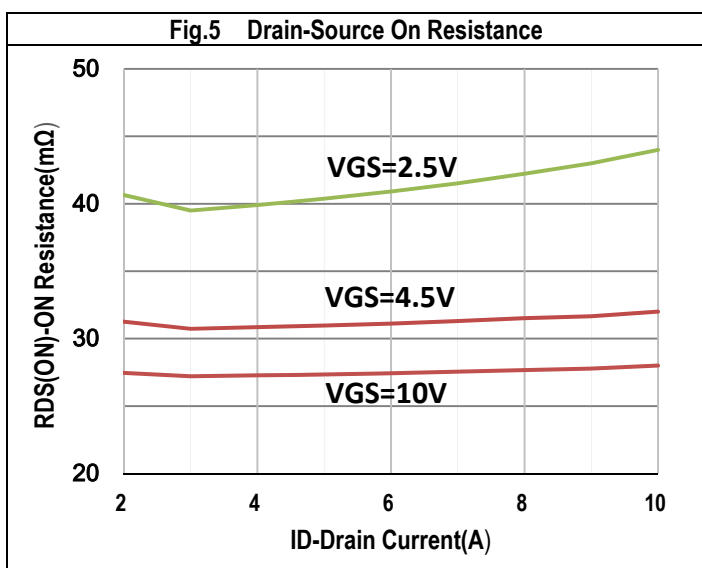
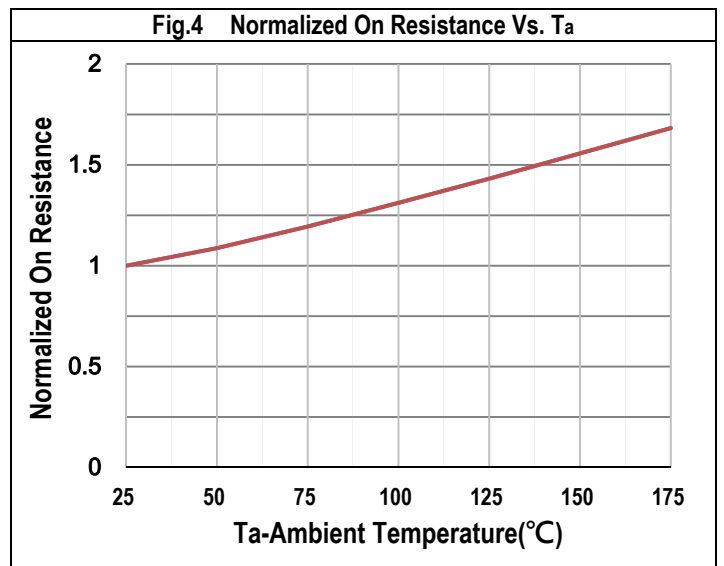
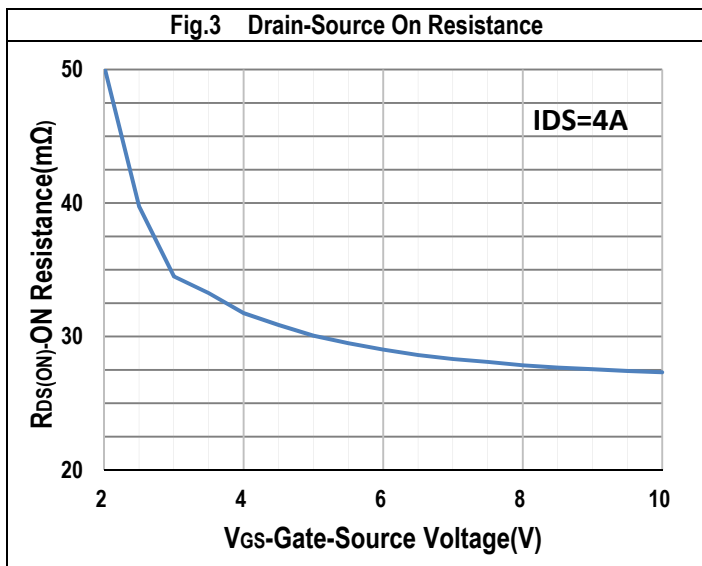
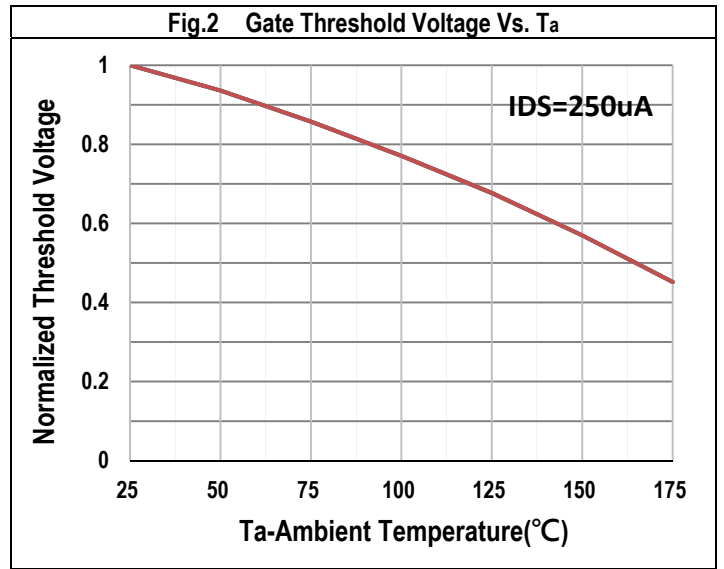
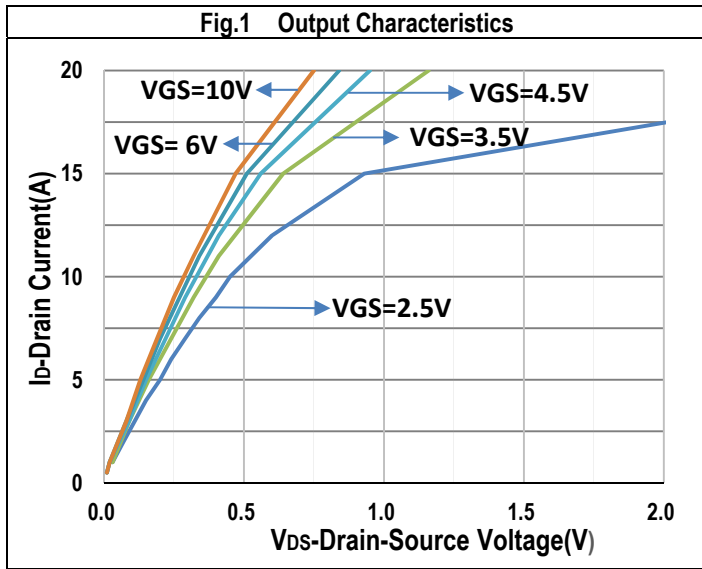
STATIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250μA	0.5	0.7	1.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _{DS} =4A	-	30	38	mΩ
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _{DS} =3A	-	34	46	mΩ
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =2.5V, I _{DS} =2A	-	41	60	mΩ
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	0.4	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =5V, I _{DS} =2A	-	4.7	-	S

DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	334	-	pF
Output Capacitance	C _{oss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	33	-	pF
Reverse Transfer Capacitance	C _{rss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	31	-	pF
Turn-On Delay Time	T _{d(on)}	V _{DS} =15V, V _{GS} =10V, I _{DS} =1A, R _{GEN} =3Ω	-	4	-	ns
Rise Time	t _r	V _{DS} =15V, V _{GS} =10V, I _{DS} =1A, R _{GEN} =3Ω	-	2	-	ns
Turn-Off Delay Time	T _{d(off)}	V _{DS} =15V, V _{GS} =10V, I _{DS} =1A, R _{GEN} =3Ω	-	14	-	ns
Fall Time	t _f	V _{DS} =15V, V _{GS} =10V, I _{DS} =1A, R _{GEN} =3Ω	-	2	-	ns

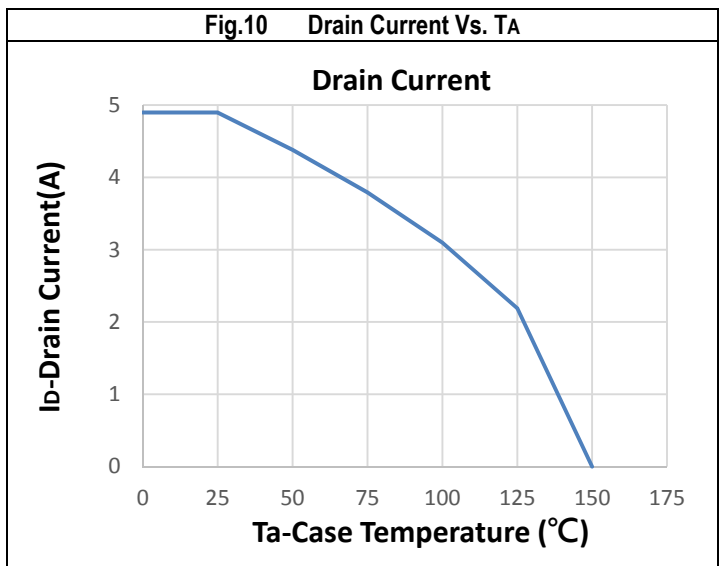
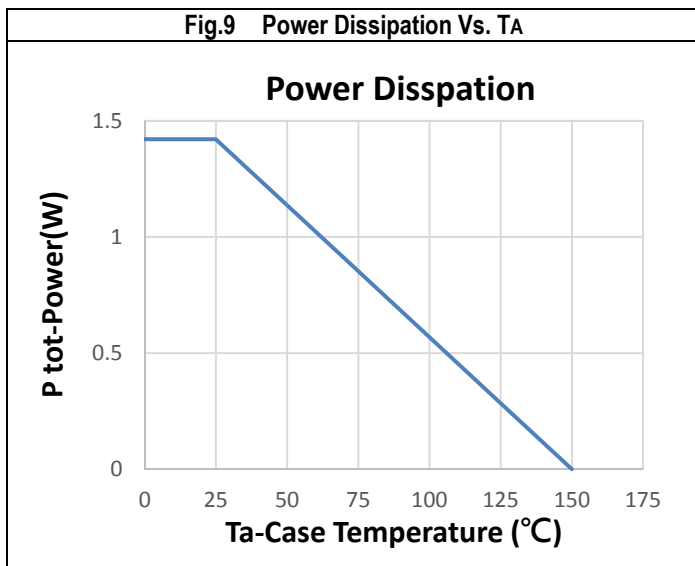
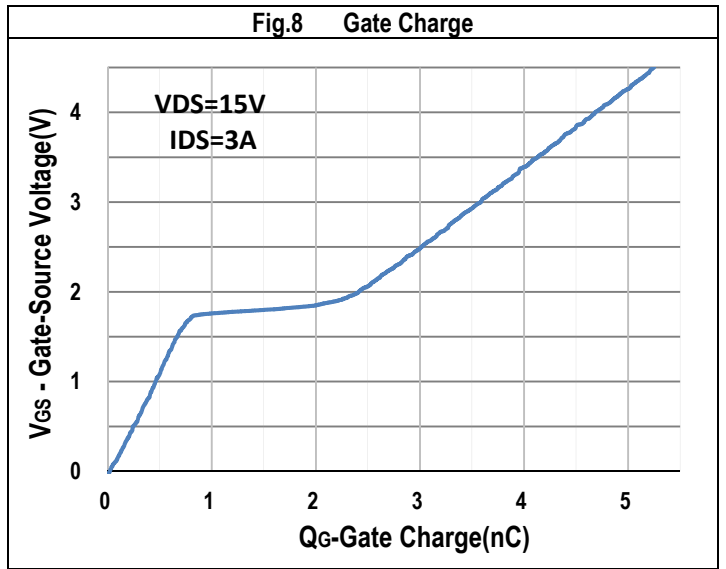
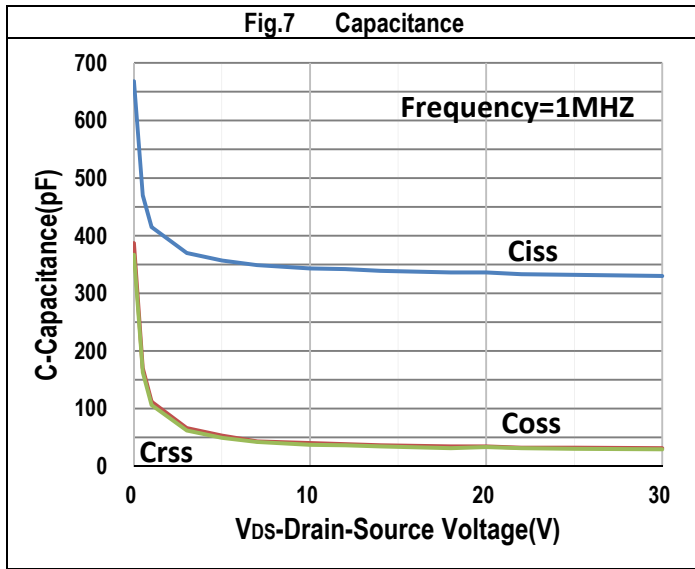
GATE CHARGE CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate to Source Gate Charge	Q _{gs}	V _{DD} =15V, I _D =3A, V _{GS} =0 to 4.5V	-	0.9	-	nC
Gate charge at threshold	Q _{g(th)}	V _{DD} =15V, I _D =3A, V _{GS} =0 to 4.5V	-	0.4	-	nC
Gate to Drain Charge	Q _{gd}	V _{DD} =15V, I _D =3A, V _{GS} =0 to 4.5V	-	1.5	-	nC
Switching charge	Q _{sw}	V _{DD} =15V, I _D =3A, V _{GS} =0 to 4.5V	-	2	-	nC
Gate charge total	Q _g	V _{DD} =15V, I _D =3A, V _{GS} =0 to 4.5V	-	5.3	-	nC
Gate charge total	Q _g	V _{DD} =15V, I _D =3A, V _{GS} =0 to 2.5V	-	2.2	-	nC
Gate plateau voltage	V _{plateau}	V _{DD} =15V, I _D =3A, V _{GS} =0 to 4.5V	-	1.8	-	V
Gate charge total, sync. FET (Q _g - Q _{gd})	Q _{g(sync)}	V _{DS} =0.1V, V _{GS} =0 to 4.5V	-	3.8	-	nC

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Diode continuous forward current (Body Diode)	I _s	T _A =25°C	-	-	4.8	A
Diode pulse current (Body Diode)	I _{SM}	T _A =25°C	-	-	19.2	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _s =1A	-	0.7	1	V
Body Diode Reverse Recovery Time	t _{rr}	V _{DD} =15V, I _F =3A, di/dt=200A/μs	-	8.9	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}	V _{DD} =15V, I _F =3A, di/dt=200A/μs	-	6.2	-	nC

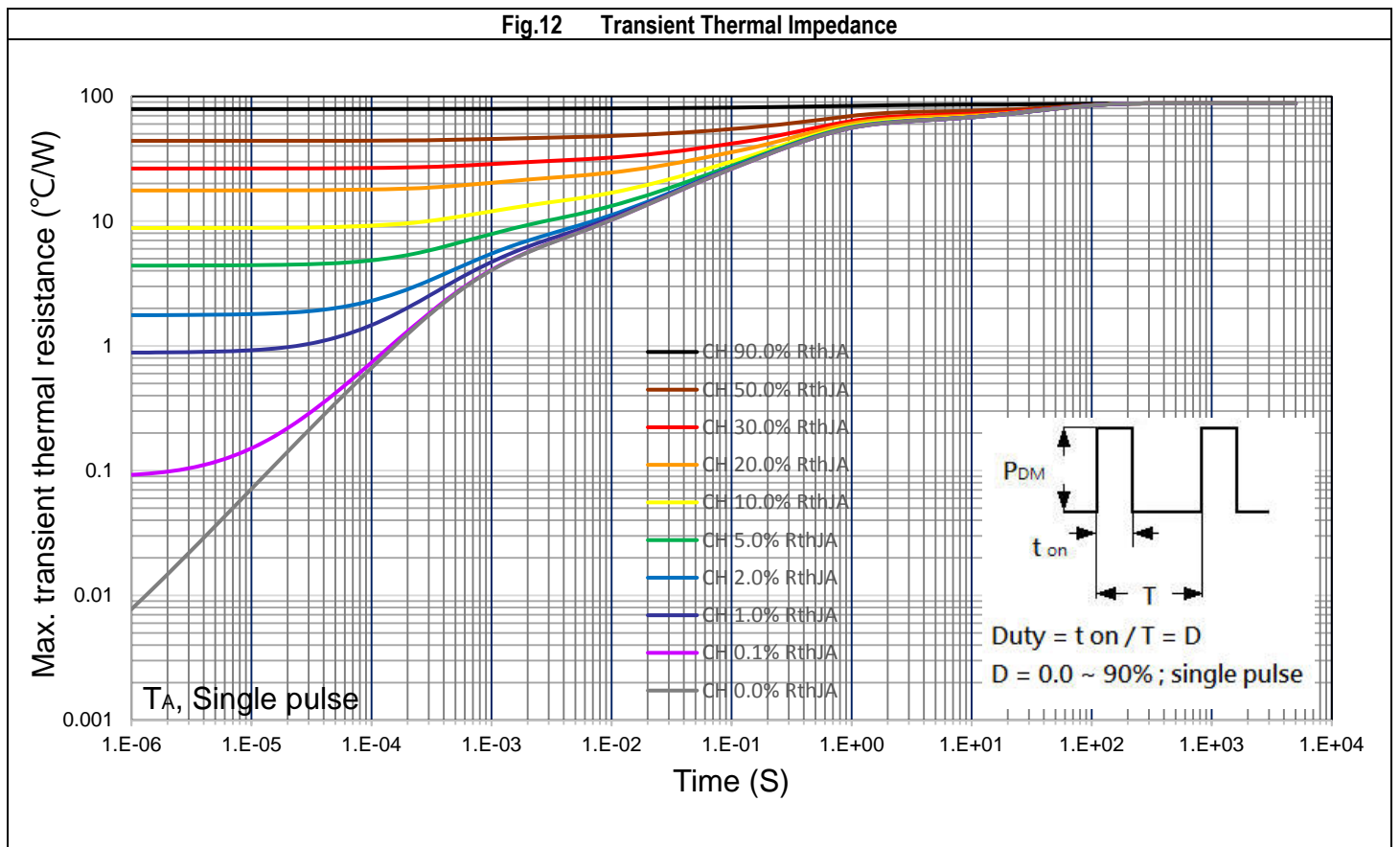
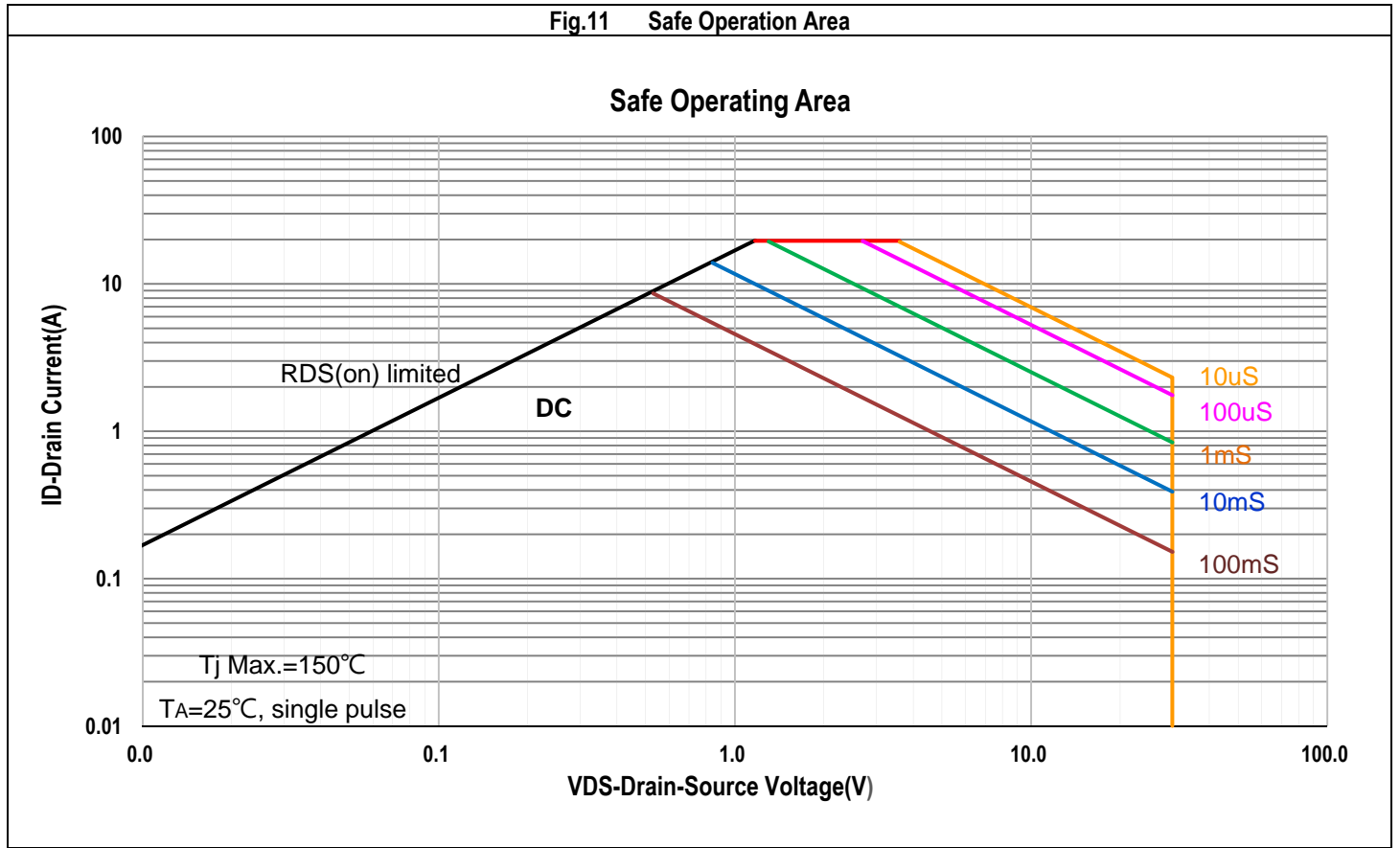
Typical Operating Characteristics



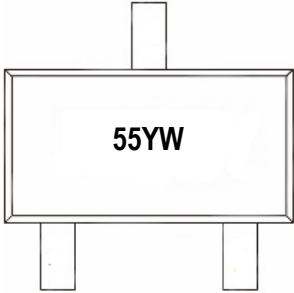
Typical Operating Characteristics (Cont.)



Typical Operating Characteristics (Cont.)



Marking Information

SOT-23S-3L (V)	Marking Rule
<p>Laser Marking</p>  <p>Diagram</p>	<p><u>Line 1</u> :</p> <p>55YW</p> <p>SS : Product Code Y : Year Code W : Week Code</p>

Year Code / Week Code Description

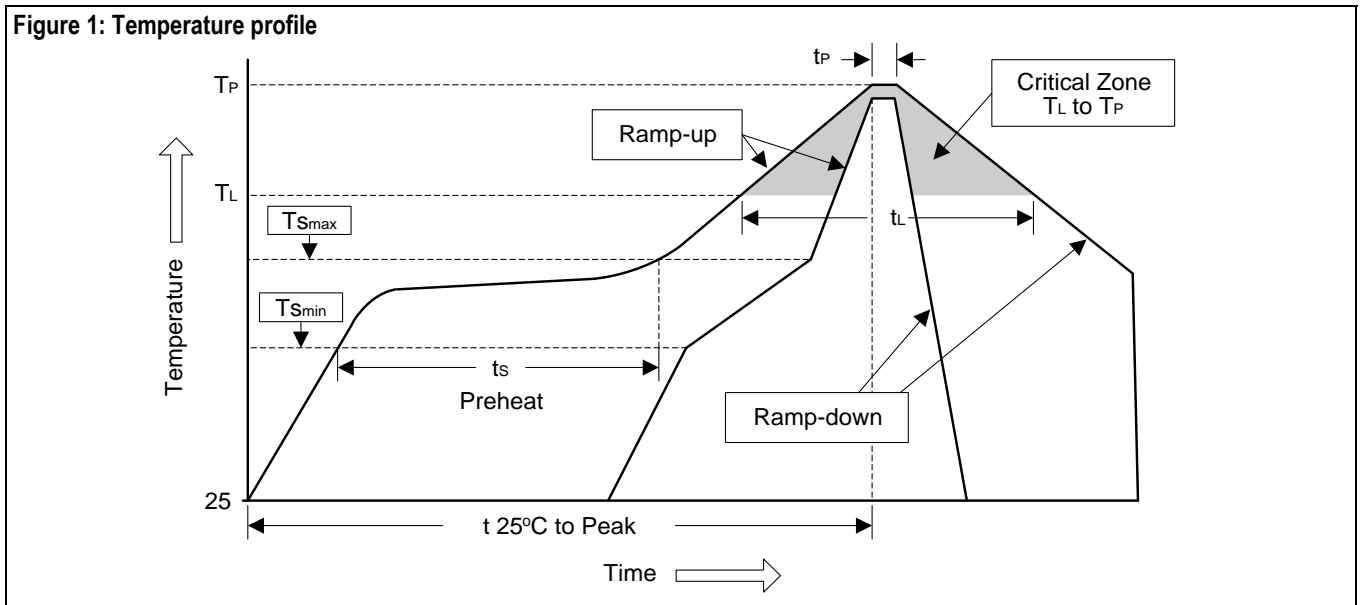
Year Code	Year	
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2	2012	2022
3	2013	2023
4	2014	2024
5	2015	2025
6	2016	2026
7	2017	2027
8	2018	2028
9	2019	2029

Week Code	Week		Week Code	Week	
A	1	2	N	27	28
B	3	4	O	29	30
C	5	6	P	31	32
D	7	8	Q	33	34
E	9	10	R	35	36
F	11	12	S	37	38
G	13	14	T	39	40
H	15	16	U	41	42
I	17	18	V	43	44
J	19	20	W	45	46
K	21	22	X	47	48
L	23	24	Y	49	50
M	25	26	Z	51	52

Soldering Methods for Silicongear's Products

1. Storage environment: Temperature=10°C to 35°C Humidity=65%±15%
2. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	<3°C/sec	<3°C/sec
Preheat		
- Temperature Min (T_{Smin})	100°C	150°C
- Temperature Max (T_{Smax})	150°C	200°C
- Time (min to max) (t_s)	60 to 120 sec	60 to 180 sec
T_{Smax} to T_L		
- Ramp-up Rate	<3°C/sec	<3°C/sec
Time maintained above:		
- Temperature (T_L)	183°C	217°C
- Time (t_L)	60 to 150 sec	60 to 150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10 to 30 sec	20 to 40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak Temperature	Dipping Time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec

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