SGMGB05340
40V, WLCSP Package, GaN E-Mode Power Transistor

GENERAL DESCRIPTION

The SGMGB05340 is GaN-on-Silicon E-mode power transistor whose drain to source breakdown voltage and source to drain breakdown voltage are greater than 40V.

PRODUCT SUMMARY

R_{DSON} & R_{SDON} (TYP) V_{GS} = 6V	R_{DSON} & R_{SDON} (MAX) V_{GS} = 6V	I_D & I_S (MAX) T_C = +25℃
3.6mΩ	4.8mΩ	20A

FEATURES

- **E-mode Transistor-Normally Off Power Switch**
- **Zero Reverse Recovery Loss**
- **Ultra High Switching Frequency**
- **RoHS Compliant and Halogen Free**

APPLICATIONS

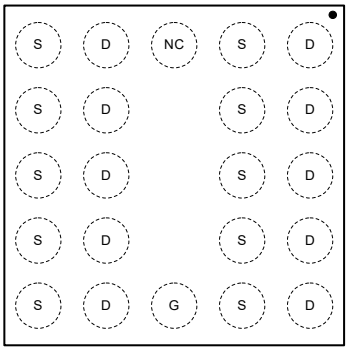
USB-C

Load Switch

OVP Protection Switch

PIN CONFIGURATION

(TOP VIEW)



WLCSP-2.15×2.15-22B

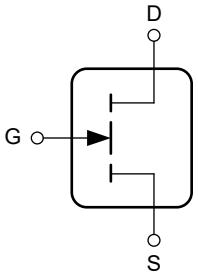
ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Drain-to- Source Voltage	V_{DS}	40	V
Source-to- Drain Voltage	V_{SD}	40	V
Drain-to- Gate Voltage	V_{DG}	40	V
Source-to- Gate Voltage	V_{SG}	40	V
Gate-to- Drain Voltage	V_{GD}	7	V
Gate-to- Source Voltage	V_{GS}	7	V
Drain Current (DC)	I_D	20	A
Drain Current (Pulse) (1)	I_{DM}	100	A
Total Dissipation	P_D	7.9	W
Junction Temperature	T_J	-55 to +125	℃
Storage Temperature Range	T_{STG}	-55 to +150	℃

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

NOTE: 1. t_{PULSE} < 300μs.

EQUIVALENT CIRCUIT

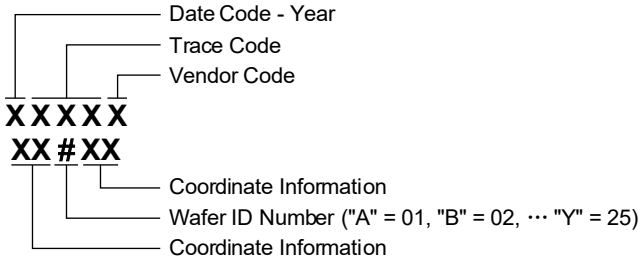


PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMGB05340	WLCSP-2.15×2.15-22B	-55℃ to +150℃	SGMGB05340TG/TR	0TL XXXXX XX#XX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXXX = Date Code, Trace Code and Vendor Code.



Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

THERMAL RESISTANCE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	12.6	℃/W
Junction-to-Ambient Thermal Resistance (1)	$R_{\theta JA}$	59.3	℃/W

NOTE 1: $R_{\theta JA}$ is determined with the device mounted on one square inch of copper pad, single layer 2oz copper on FR4 board.

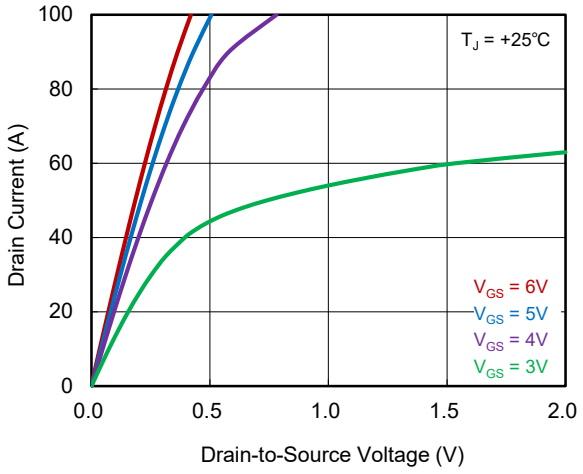
ELECTRICAL CHARACTERISTICS

(T_A = +25℃, unless otherwise noted.)

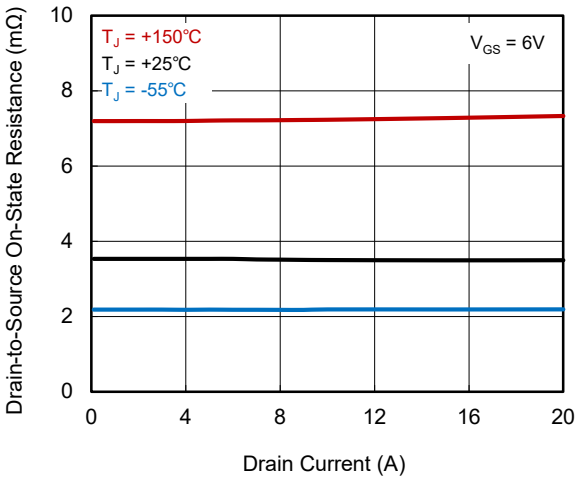
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Static OFF Characteristics						
Drain-to-Source Breakdown Voltage	V_{BR_DSS}	V_{GS} = 0V, I_{DS} = 500μA	40			V
Source-to-Drain Breakdown Voltage	$V_{BR\ SDS}$	V_{GD} = 0V, I_{SD} = 500μA	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0V, V_D = 40V		0.2	20	μA
	I_{SDS}	V_{GD} = 0V, V_S = 40V		0.2	20	
Gate-to-Drain Leakage Current	I_{GDS}	V_{GD} = 6V, V_{DS} = 0V		250		μA
		V_{GD} = -6V, V_{DS} = 0V		-0.1		
Gate-to-Source Leakage Current	I_{GSS}	V_{GS} = 6V, V_{SD} = 0V		250		μA
		V_{GS} = -6V, V_{SD} = 0V		-0.1		
Static ON Characteristics						
Gate-to-Source Threshold Voltage	V_{GD_TH}	V_G = V_S, V_D = 0V, I_{SD} = 13.3mA	1	1.5	2.5	V
	V_{GS_TH}	V_G = V_D, V_S = 0V, I_{DS} = 13.3mA	1	1.5	2.5	
Drain-to-Source On-State Resistance	R_{DSON}	V_{GS} = 6V, V_S = 0V, I_{DS} = 10A		3.6	4.8	mΩ
Source-to-Drain On-State Resistance	R_{SDON}	V_{GD} = 6V, V_D = 0V, I_{SD} = 10A		3.6	4.8	mΩ
Gate Resistance	R_G	f = 1MHz		1.2		Ω
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_G = 0V, V_D = 20V or V_G = 0V, V_S = 20V		425		pF
Output Capacitance	C_{OSS}			290		
Reverse Transfer Capacitance	C_{RSS}			144		
Total Gate Charge	Q_G	V_G = 6V, V_D = 20V, I_D = 10A		10.8		nC
		V_G = 6V, V_S = 20V, I_S = 10A				
Gate-to-Source Charge	Q_{GS}	V_{DS} = 20V, I_{DS} = 10A		0.4		nC
Gate-to-Drain Charge	Q_{GD}			5.4		
Gate-to-Drain Charge	Q_{GD}	V_{SD} = 20V, I_{SD} = 10A		0.4		nC
Gate-to-Source Charge	Q_{GS}			5.4		
Output Charge	Q_{OSS}	V_G = 0V, V_D = 20V		8		nC
		V_G = 0V, V_S = 20V				

TYPICAL PERFORMANCE CHARACTERISTICS

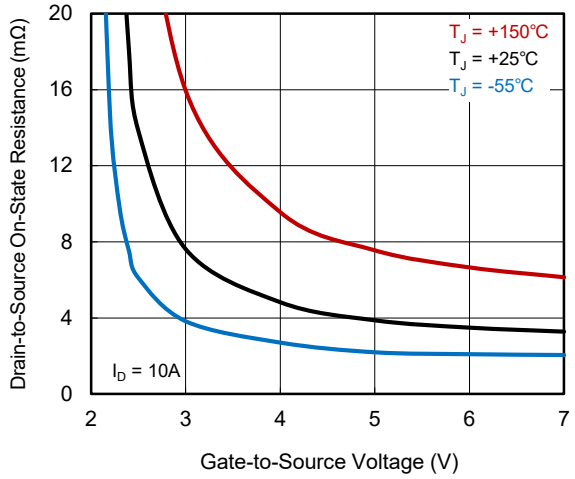
Output Characteristics



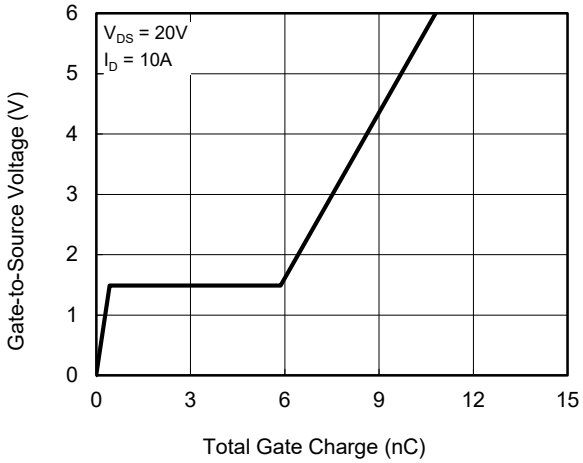
Drain-to-Source On-State Resistance vs. Drain Current



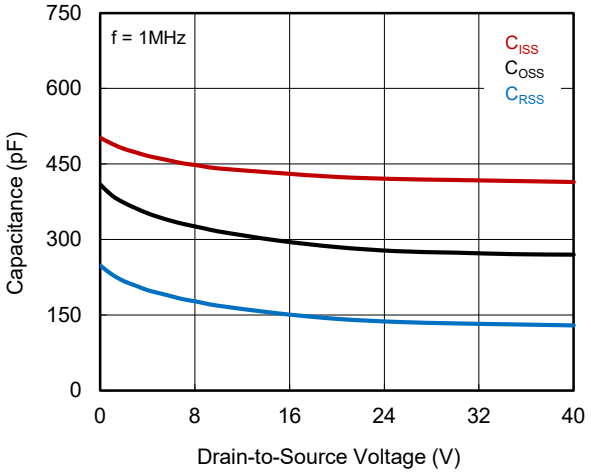
Drain-to-Source On-State Resistance vs. Gate-to-Source Voltage



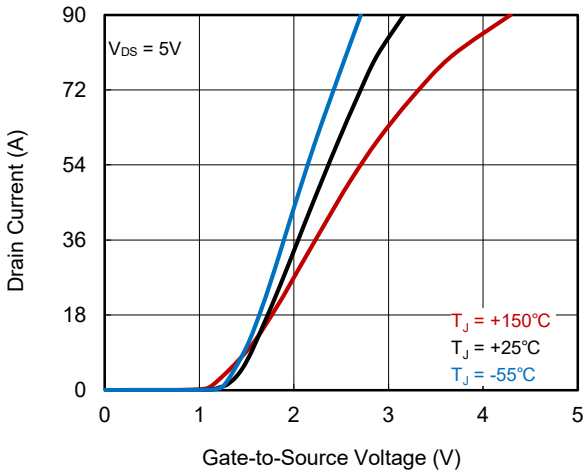
Gate Charge Characteristics



Capacitance Characteristics

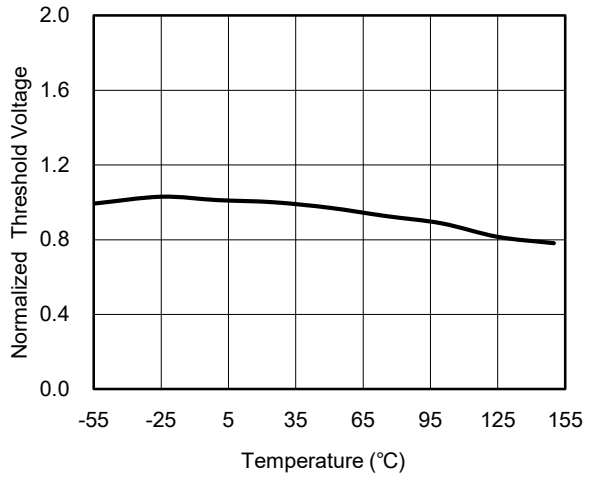


Transfer Characteristics

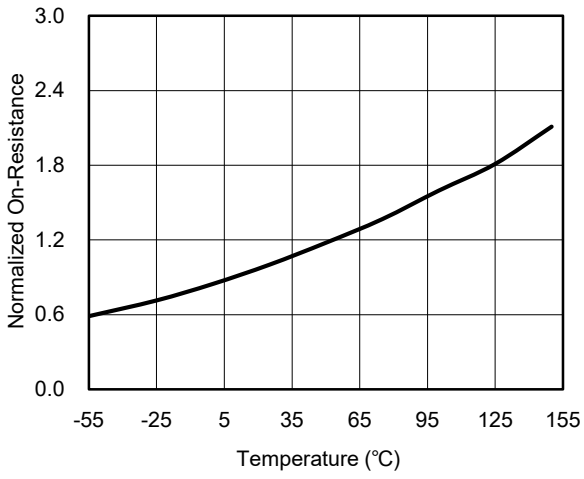


TYPICAL PERFORMANCE CHARACTERISTICS (continued)

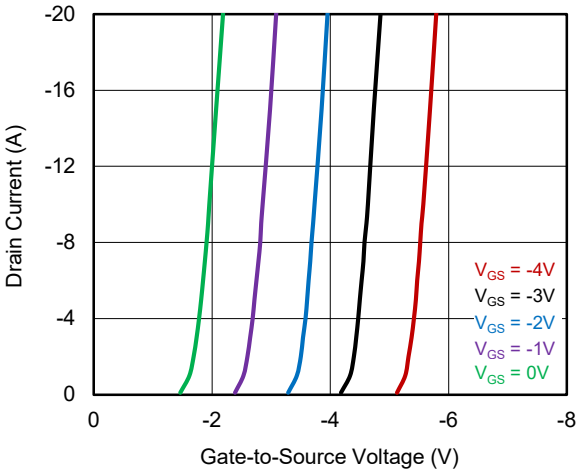
Normalized Threshold Voltage vs. Junction Temperature



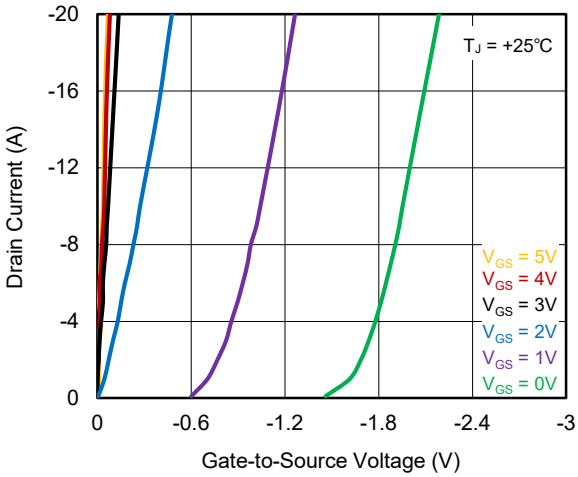
Normalized On-Resistance vs. Junction Temperature



Reverse Drain-to-Source Characteristics



Reverse Drain-to-Source Characteristics



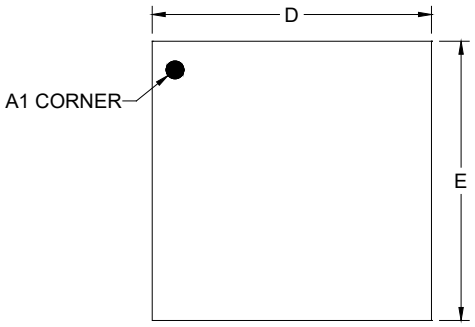
REVISION HISTORY

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

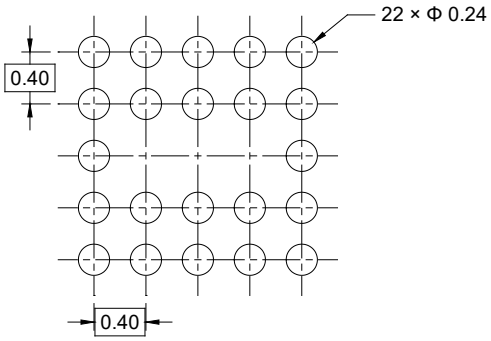
Changes from Original (JUNE 2025) to REV.A	Page
Changed from product preview to production data	All

PACKAGE OUTLINE DIMENSIONS

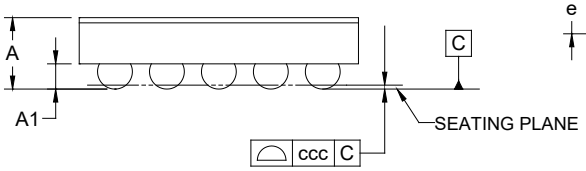
WLCSP-2.15×2.15-22B



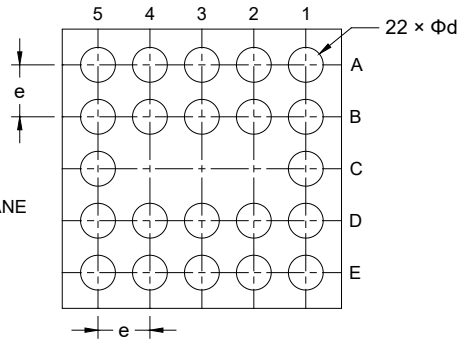
TOP VIEW



RECOMMENDED LAND PATTERN (Unit: mm)



SIDE VIEW



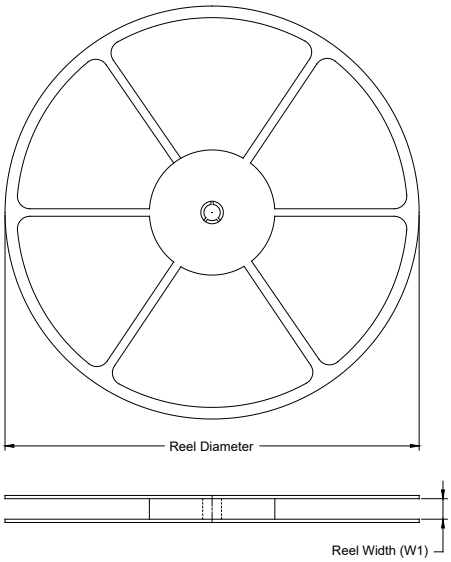
BOTTOM VIEW

Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	-	-	0.588
A1	0.174	-	0.214
D	2.120	-	2.180
E	2.120	-	2.180
d	0.238	-	0.298
e	0.400 BSC		
ccc	0.050		

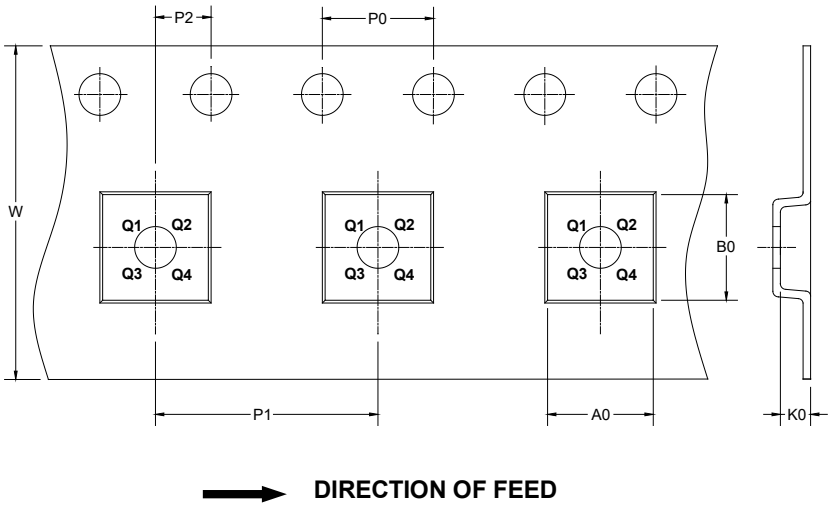
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



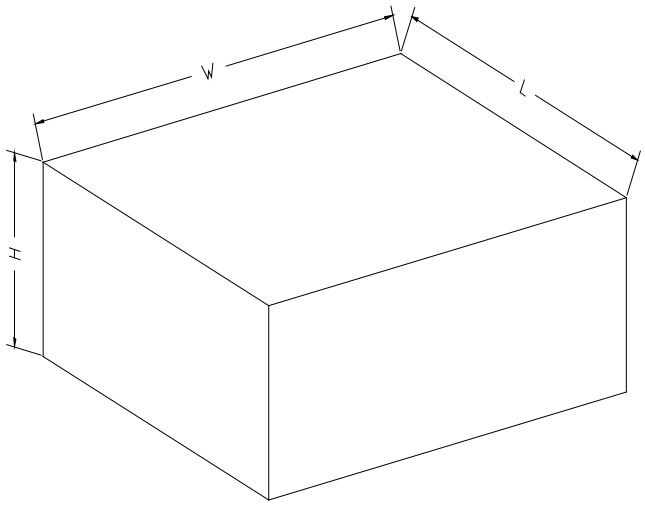
NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
WLCSP-2.15×2.15-22B	7"	9.5	2.33	2.33	0.88	4.0	4.0	2.0	8.0	Q2

DD0001

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
7″ (Option)	368	227	224	8
7″	442	410	224	18

DD0002