



SGMNQ25440

40V, Power, Single N-Channel, PDFN Package, MOSFET

FEATURES

- Low On-State Resistance
- Low Total Gate Charge and Capacitance Losses
- Small Footprint ($3.3 \times 3.3 \text{mm}^2$) for Compact Design
- RoHS Compliant and Halogen-Free

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Drain-to-Source Voltage	V_{DS}	40	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Drain Current ⁽¹⁾	I_D	$T_C = +25^\circ\text{C}$	130
		$T_C = +100^\circ\text{C}$	83
		$T_A = +25^\circ\text{C}$	24
		$T_A = +70^\circ\text{C}$	19
Drain Current (Pulse) ⁽²⁾	I_{DM}	470	A
Total Dissipation	P_D	$T_C = +25^\circ\text{C}$	78
		$T_C = +100^\circ\text{C}$	31
		$T_A = +25^\circ\text{C}$	2.2
		$T_A = +70^\circ\text{C}$	1.4
Avalanche Current ⁽³⁾	I_{AS}	49	A
Avalanche Energy ⁽³⁾	E_{AS}	120	mJ
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Lead Temperature (Soldering, 10s)		+260	$^\circ\text{C}$

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.

NOTES:

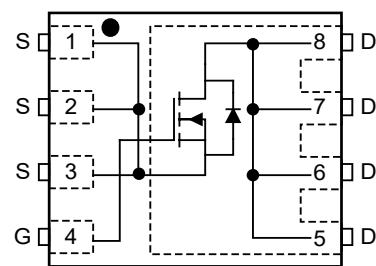
1. The current will be limited by Package, PCB, thermal design and operating temperature.
2. $t_{PLUSE} < 10\mu\text{s}$.
3. Parts are 100% tested at $V_{GS} = 10\text{V}$, $I_L = 34.6\text{A}$, and $E_{AS} = 60\text{mJ}$.

PRODUCT SUMMARY

$R_{DS(on)}$ (TYP) $V_{GS} = 10\text{V}$	$R_{DS(on)}$ (MAX) $V_{GS} = 10\text{V}$	I_D (MAX) $T_C = +25^\circ\text{C}$
2.1m Ω	2.8m Ω	130A

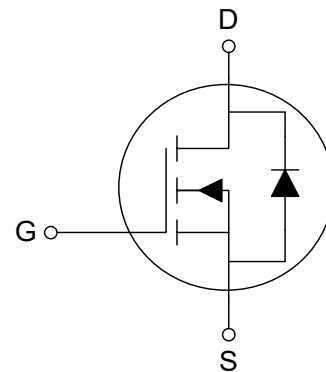
PIN CONFIGURATION

(TOP VIEW)



PDFN-3.3x3.3-8L

EQUIVALENT CIRCUIT



APPLICATIONS

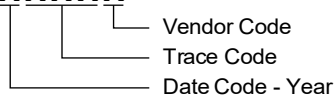
- Power Tool
- Brushless DC Motor Control
- Reverse Battery Protection
- DC/DC Converters
- Power Load Switch and eFuse
- High/Low-side Switches

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMNQ25440	PDFN-3.3×3.3-8L	-55°C to +150°C	SGMNQ25440TPDB8G/TR	SGM1OF TPDB8 XXXXX	Tape and Reel, 5000

MARKING INFORMATION

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

XXXXX

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

PARAMETER	SYMBOL	TYP	UNITS
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	1.6	°C/W
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	56	°C/W

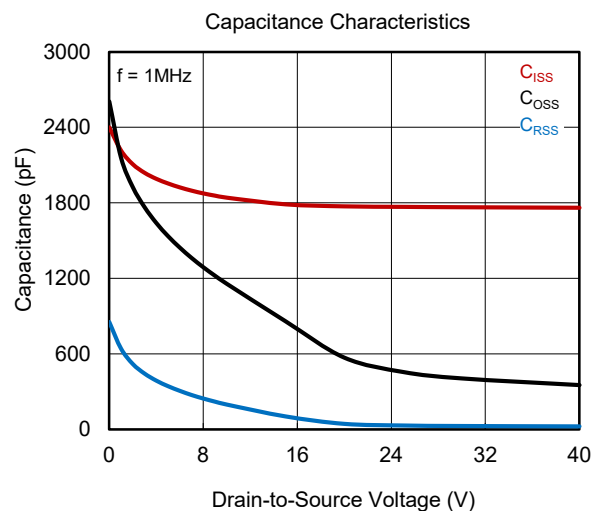
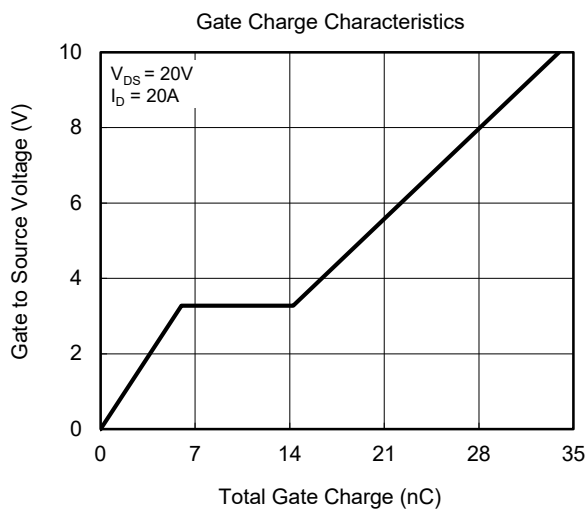
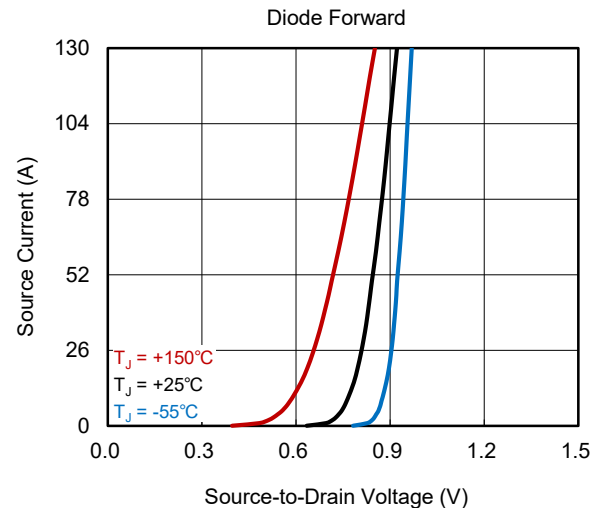
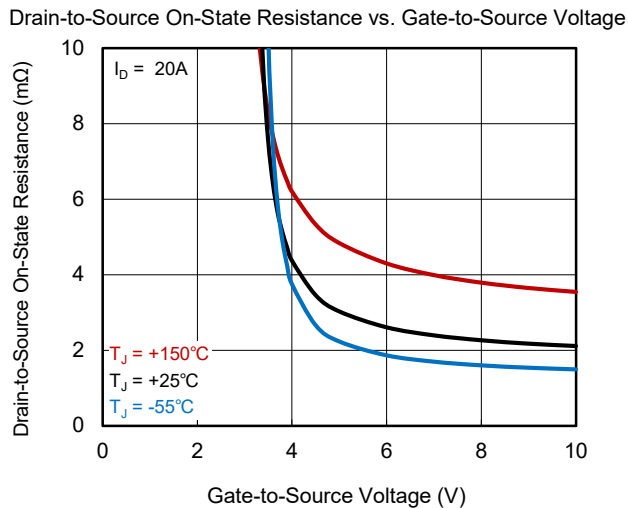
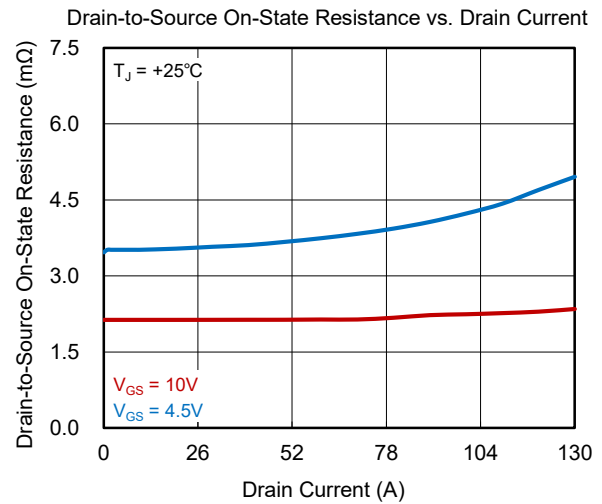
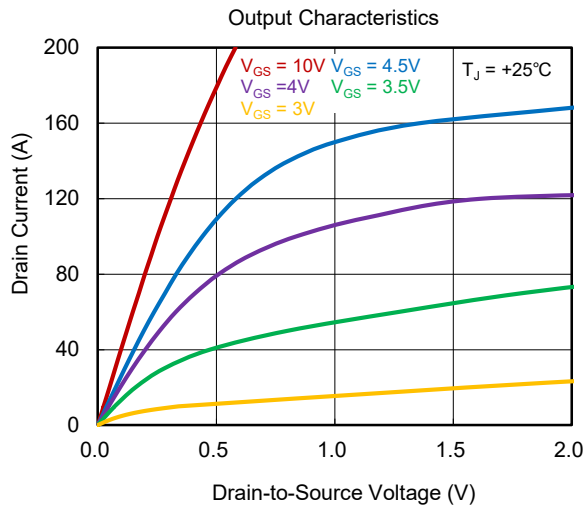
NOTE: 1. $R_{\theta JA}$ is determined with the device mounted on one square inch of copper pad, 2oz copper on FR4 board.

ELECTRICAL CHARACTERISTICS

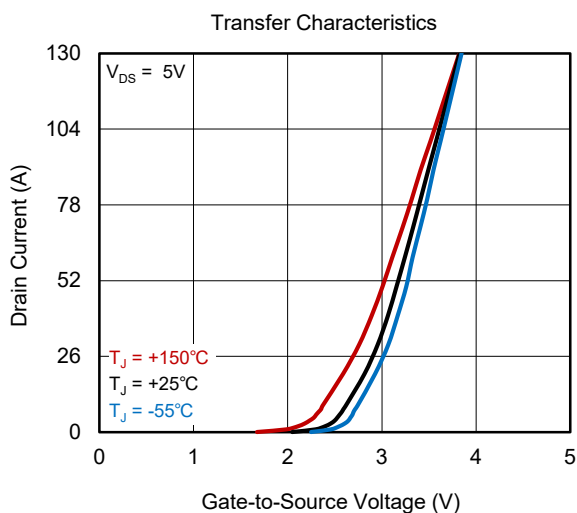
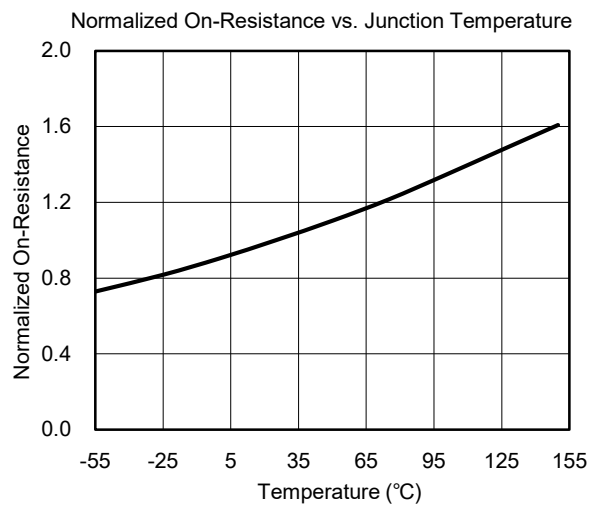
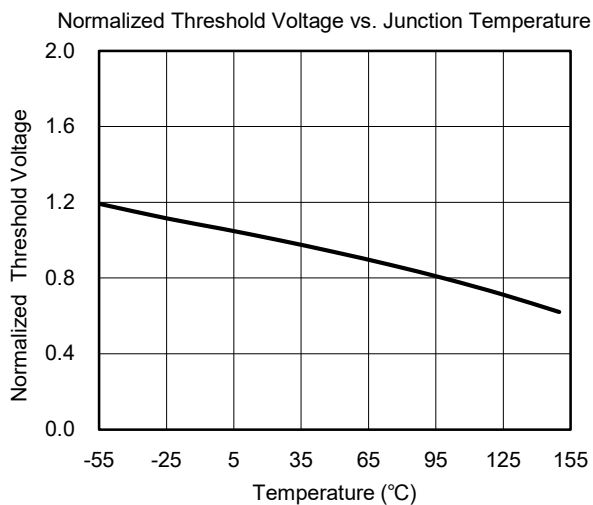
(T_A = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Static OFF Characteristics							
Drain-to-Source Breakdown Voltage	V _{BR_DSS}	V _{GS} = 0V, I _D = 250μA		40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0V, V _{DS} = 32V				10	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V				±100	nA
Static ON Characteristics							
Gate-to-Source Threshold Voltage	V _{GS_TH}	V _{GS} = V _{DS} , I _D = 250μA		1.2	1.7	2.5	V
Drain-to-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 20A			2.1	2.8	mΩ
		V _{GS} = 4.5V, I _D = 20A			3.5	4.8	
Forward Transconductance	g _{fs}	V _{DS} = 5V, I _D =20A			33		S
Gate Resistance	R _G	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz			1.3		Ω
Diode Characteristics							
Diode Forward Voltage	V _{FSD}	V _{GS} = 0V, I _S = 20A			0.8	1.2	V
Reverse Recovery Time	t _{RR}	V _{GS} = 0V, I _S = 20A, di/dt = 100A/μs			43		ns
Reverse Recovery Charge	Q _{RR}				34		nC
Dynamic Characteristics							
Input Capacitance	C _{ISS}	V _{GS} = 0V, V _{DS} = 20V, f = 1MHz			1775		pF
Output Capacitance	C _{OSS}				575		
Reverse Transfer Capacitance	C _{RSS}				45		
Total Gate Charge	Q _G	V _{DS} = 20V, I _D = 20A	V _{GS} = 10V		33.9		nC
			V _{GS} = 4.5V		17.3		
Gate-to-Source Charge	Q _{GS}	V _{DS} = 20V, V _{GS} = 4.5V, I _D = 20A			6		
Gate-to-Drain Charge	Q _{GD}				8.3		
Switch Characteristics							
Turn-On Delay Time	t _{D_ON}	V _{GS} = 20V, V _{DS} = 10V, I _D = 20A, R _G = 3Ω			7.2		ns
Rise Time	t _R				26.6		
Turn-Off Delay Time	t _{D_OFF}				24.6		
Fall Time	t _F				7.7		

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

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

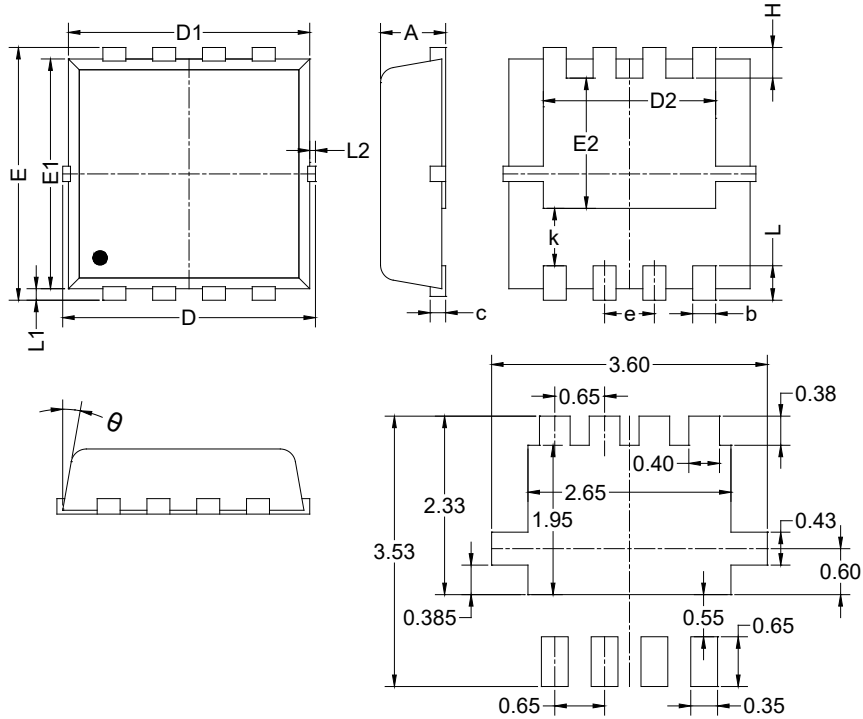
Changes from Original to REV.A (AUGUST 2025)

Page

Changed from product preview to production data.....All

PACKAGE OUTLINE DIMENSIONS

PDFN-3.3×3.3-8L



RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.700	-	0.900
b	0.250	-	0.390
c	0.140	-	0.200
D	3.100	-	3.500
D1	3.050	-	3.250
D2	2.150	-	2.350
E	3.100	-	3.500
E1	2.900	-	3.100
E2	1.600	-	1.800
e	0.650 BSC		
H	0.250	-	0.550
k	0.650	-	0.850
L	0.300	-	0.600
L1	0.050	-	0.250
L2	-	-	0.150
θ	8°	-	12°

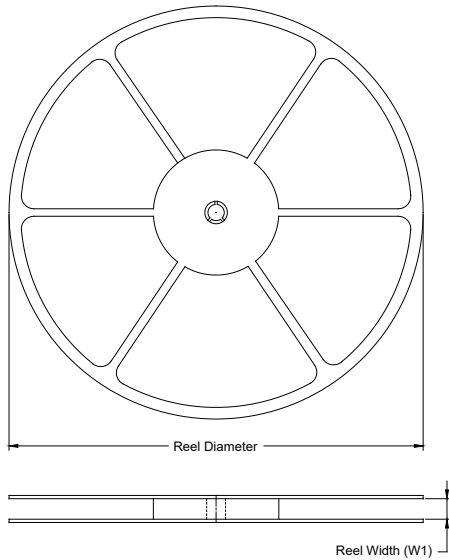
NOTES:

1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.

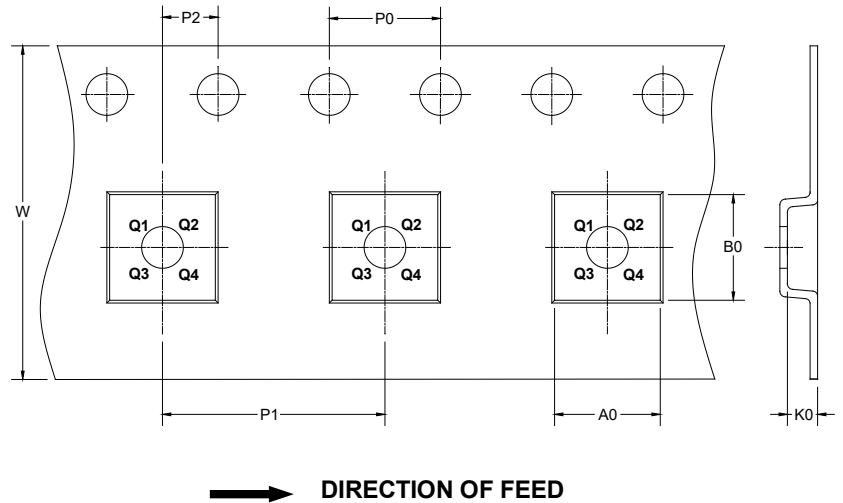
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

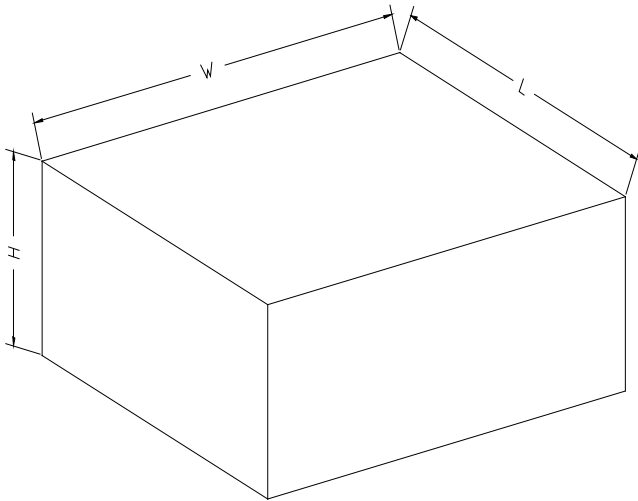
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
PDFN-3.3×3.3-8L	13"	12.4	3.60	3.60	1.10	4.0	8.0	2.0	12.0	Q1

DD0001

PACKAGE INFORMATION

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
13"	386	280	370	5

DP0002