



SGMNQ09440

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

FEATURES

- Low On-State Resistance
- Low Total Gate Charge and Capacitance Losses
- Small Footprint (5×6mm²) for Compact Design
- RoHS Compliant and Halogen Free

PRODUCT SUMMARY

$R_{DS(on)}$ (TYP) $V_{GS} = 10V$	$R_{DS(on)}$ (MAX) $V_{GS} = 10V$	I_D (MAX) $T_C = +25^\circ C$
0.6m Ω	0.9m Ω	340A

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	I_D	$T_C = +25^\circ C$	340
		$T_C = +100^\circ C$	226
Drain Current (Pulse) ⁽¹⁾	I_{DM}	880	A
Total Dissipation	P_D	$T_C = +25^\circ C$	138
		$T_C = +100^\circ C$	83
Avalanche Current ⁽²⁾	I_{AS}	107	A
Avalanche Energy ⁽²⁾	E_{AS}	572.45	mJ
Junction Temperature	T_J	+150	$^\circ C$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ C$
Lead Temperature (Soldering, 10s)		+260	$^\circ C$

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.

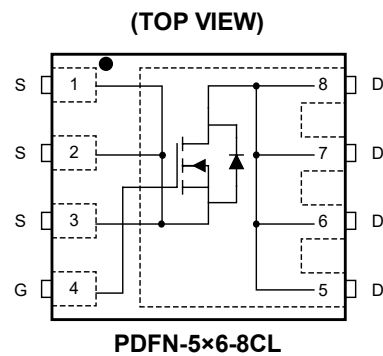
NOTES:

1. $t_{PULSE} < 10\mu s$.
2. Parts are 100% tested at $V_{GS} = 10V$, $I_L = 78A$, and $E_{AS} = 304.2mJ$.

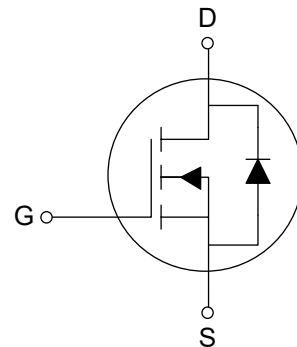
APPLICATIONS

- Power Tool
- Brushless DC Motor Control
- Hotswap/In-Rush Current Management
- DC/DC Converters
- Power Load Switch and eFuse

PIN CONFIGURATION



EQUIVALENT CIRCUIT



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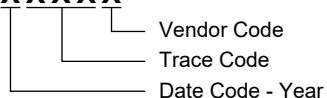
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMNQ09440	PDFN-5x6-8CL	-55°C to +150°C	SGMNQ09440TPDA8G/TR	SGM0CG TPDA8 XXXXX	Tape and Reel, 4000

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 MAXIMUM RATINGS

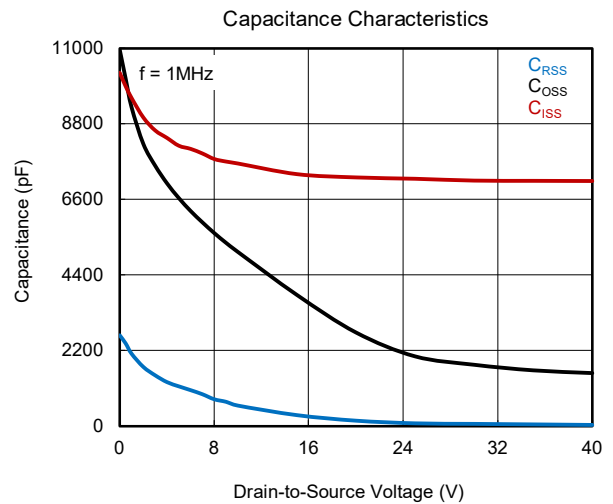
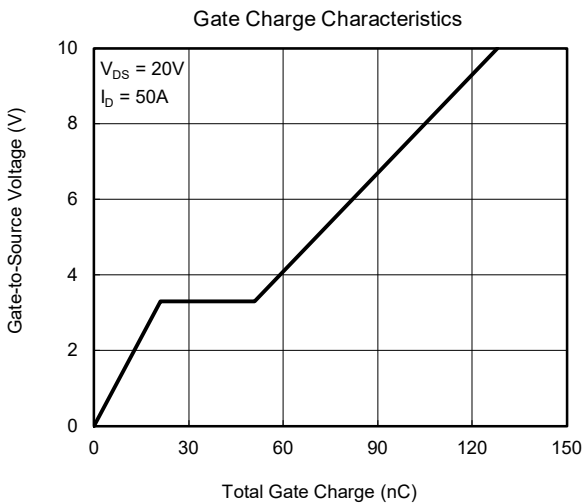
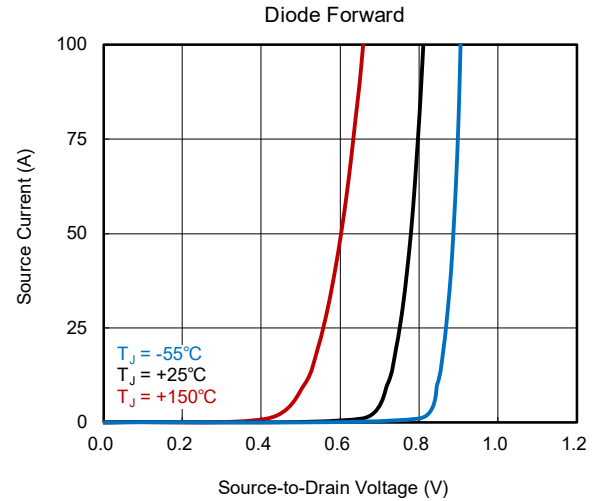
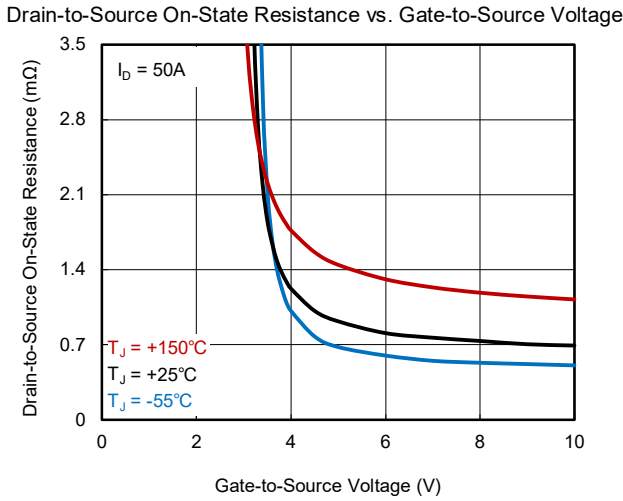
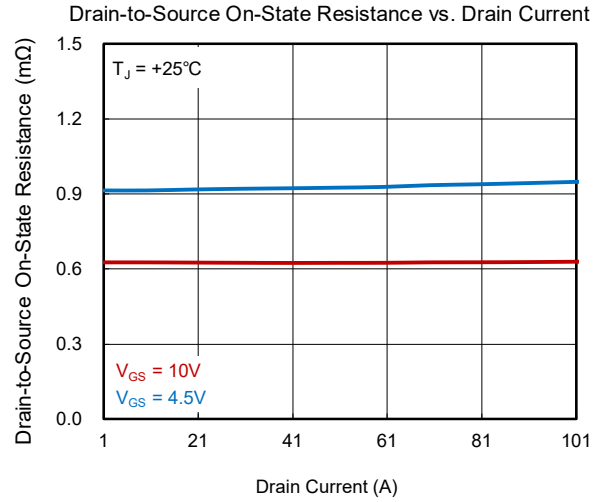
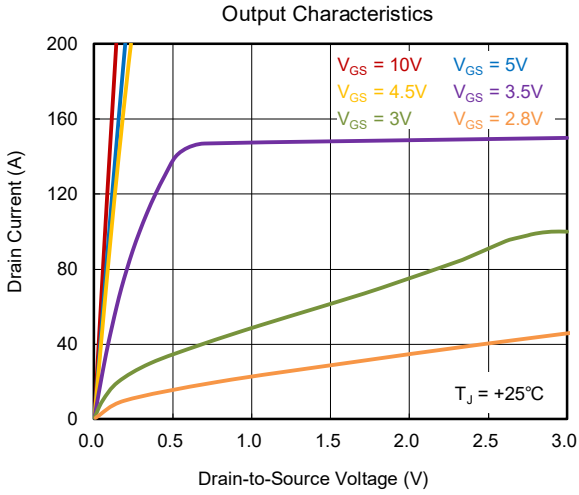
PARAMETER	SYMBOL	VALUE	UNITS
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	0.9	°C/W
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	42	°C/W

ELECTRICAL CHARACTERISTICS

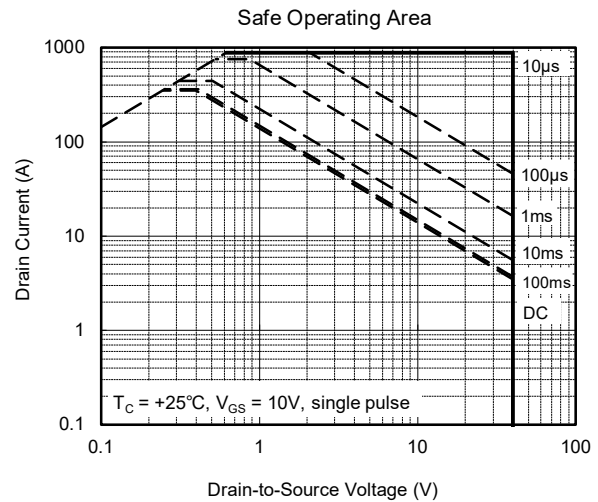
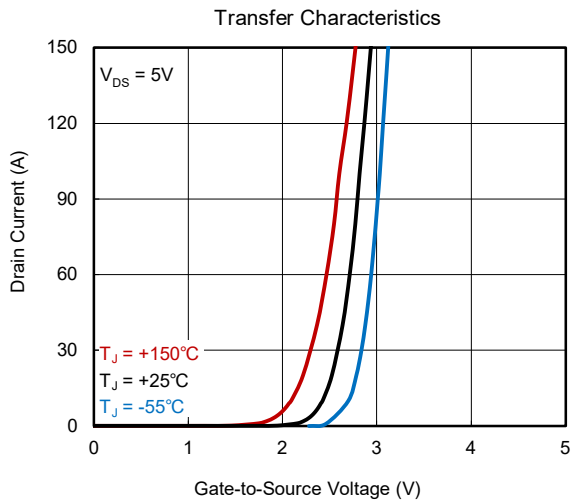
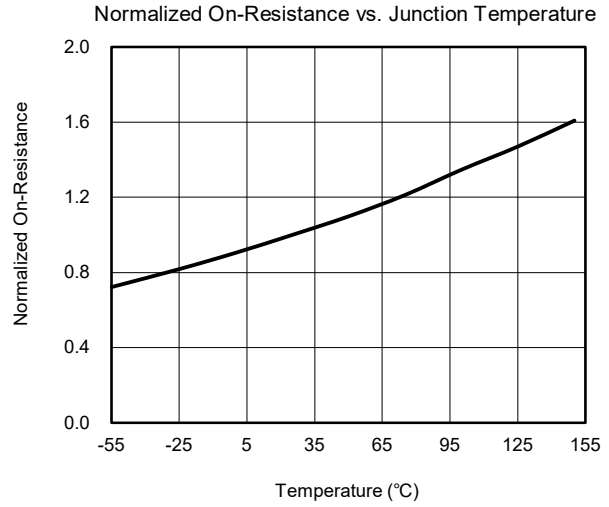
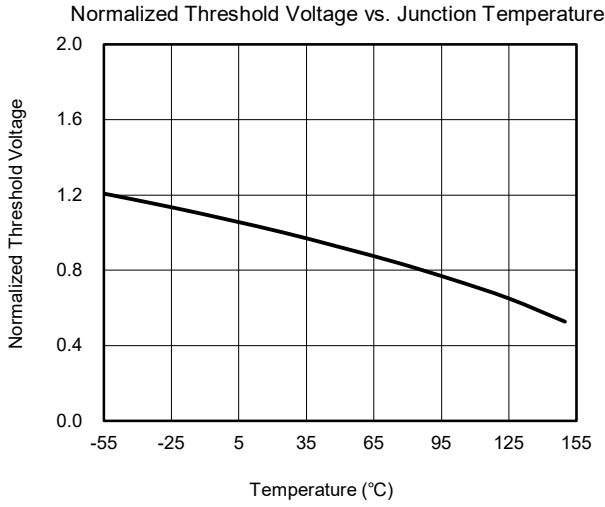
(T_A = +25°C, unless otherwise noted.)

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	1.6	2.2	V
Drain-to-Source On-State Resistance	R _{DS(on)}	I _D = 50A	V _{GS} = 10V	0.6	0.9	mΩ
			V _{GS} = 4.5V	0.9	1.3	
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 50A		95		S
Gate Resistance	R _G	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz		1.6		Ω
Diode Characteristics						
Diode Forward Voltage	V _{F_SD}	V _{GS} = 0V, I _S = 50A		0.7	1.2	V
Reverse Recovery Time	t _{RR}	V _{GS} = 0V, I _S = 50A, di/dt = 100A/μs		82		ns
Reverse Recovery Charge	Q _{RR}			141		nC
Dynamic Characteristics						
Input Capacitance	C _{ISS}	V _{GS} = 0V, V _{DS} = 20V, f = 1MHz		7206		pF
Output Capacitance	C _{OSS}			2022		
Reverse Transfer Capacitance	C _{RSS}			78		
Total Gate Charge	Q _G	V _{DS} = 20V, I _D = 50A	V _{GS} = 10V	128		nC
			V _{GS} = 4.5V	63		
Gate-to-Source Charge	Q _{GS}	V _{GS} = 4.5V, V _{DS} = 20V, I _D = 50A		21		nC
Gate-to-Drain Charge	Q _{GD}			30		
Switch Characteristics						
Turn-On Delay Time	t _{D_ON}	V _{GS} = 10V, V _{DS} = 20V, I _D = 50A, R _G = 3Ω		12		ns
Rise Time	t _R			51		
Turn-Off Delay Time	t _{D_OFF}			80		
Fall Time	t _F			120		

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

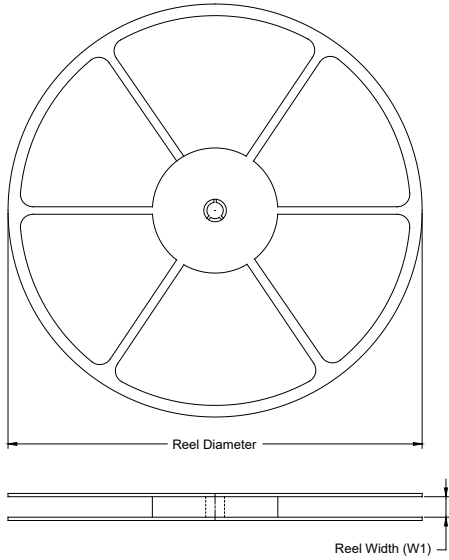
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Original (JUNE 2024) to REV.A	Page
Changed from product preview to production data.....	All

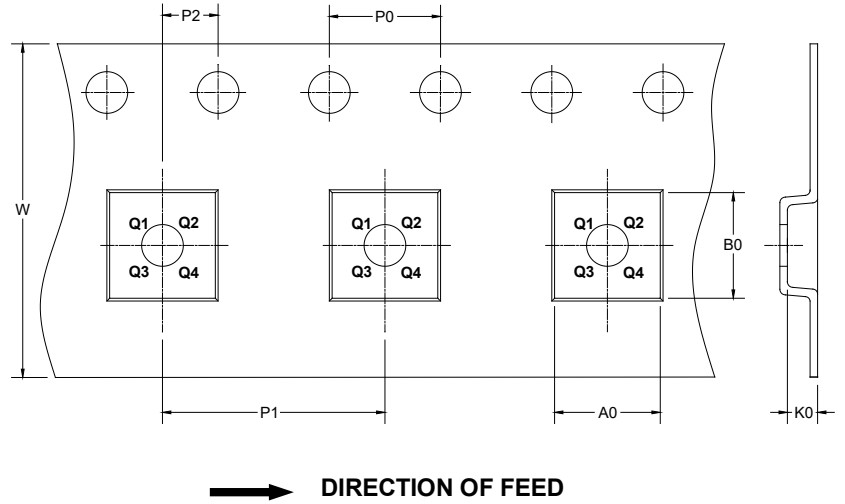
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

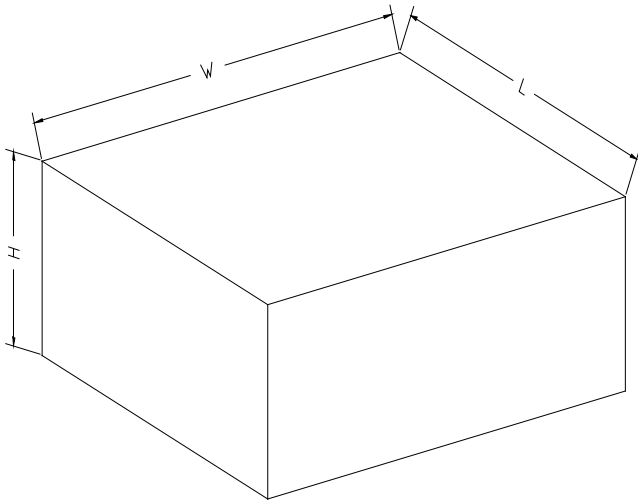
KEY PARAMETER LIST OF TAPE AND REEL

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-5×6-8CL	13"	12.4	6.45	5.30	1.40	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

DD0002