

FEATURES

- Low On-State Resistance
- Low Total Gate Charge and Capacitance Losses
- 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	$T_C = +25^\circ\text{C}$	40
		$T_C = +100^\circ\text{C}$	34
		$T_A = +25^\circ\text{C}$	13
		$T_A = +70^\circ\text{C}$	11
Drain Current (Pulse) ⁽²⁾	I_{DM}	130	A
Total Dissipation	P_D	$T_C = +25^\circ\text{C}$	40
		$T_C = +100^\circ\text{C}$	16
		$T_A = +25^\circ\text{C}$	2.5
		$T_A = +70^\circ\text{C}$	1.6
Avalanche Current ⁽³⁾	I_{AS}	32	A
Avalanche Energy ⁽³⁾	E_{AS}	51.2	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:

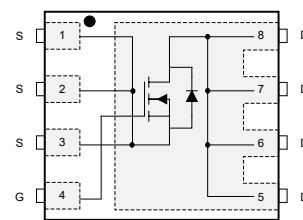
1. The current will be limited by package, PCB, thermal design and operating temperature.
2. $t_{PLUSE} < 10\mu\text{s}$.
3. Parts are 100% tested at $V_{GS} = 10\text{V}$, $I_L = 22.6\text{A}$, and $E_{AS} = 25.6\text{mJ}$.

PRODUCT SUMMARY

$R_{DS(on)}$ (TYP) $V_{GS} = 10\text{V}$	$R_{DS(on)}$ (MAX) $V_{GS} = 10\text{V}$	I_D (MAX) $T_C = +25^\circ\text{C}$
5.1m Ω	6.4m Ω	40A

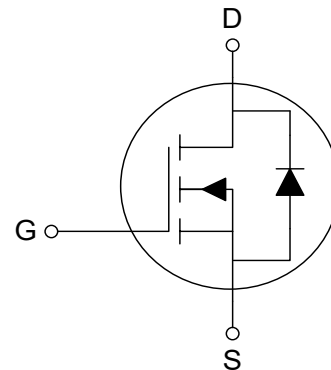
PIN CONFIGURATION

(TOP VIEW)



PDFN-5x6-8BL

EQUIVALENT CIRCUIT



APPLICATIONS

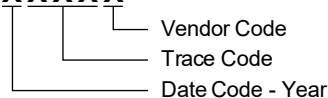
Half Bridge
Aerial Photography
DC/DC Converters
Motor Applications
High-Speed Line Driver
Power Tools Applications

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMNQ51440	PDFN-5×6-8BL	-55°C to +150°C	SGMNQ51440TPDA8G/TR	SGM2BI TPDA8 XXXXXX	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

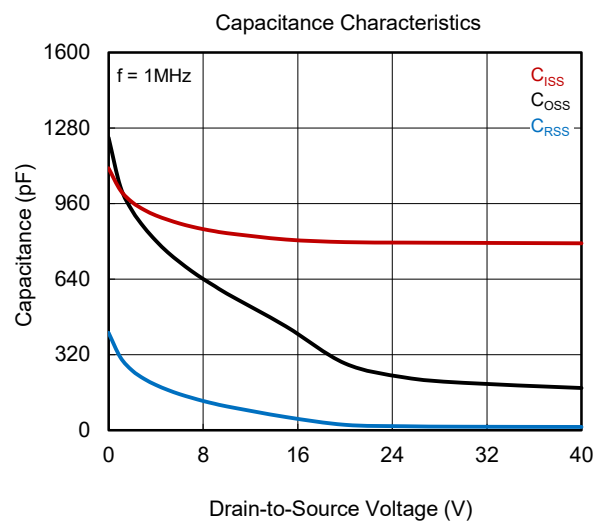
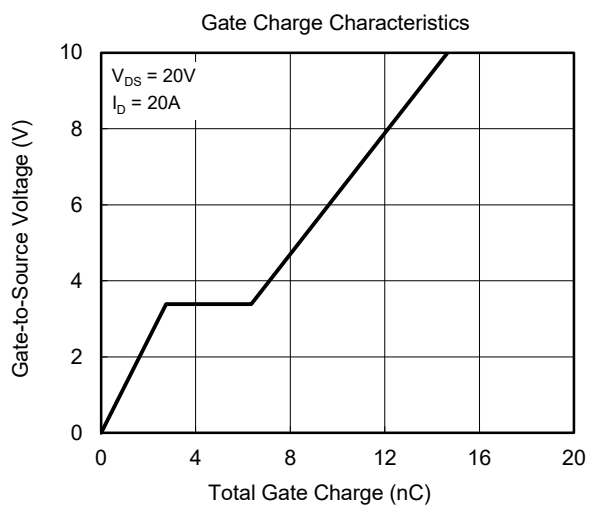
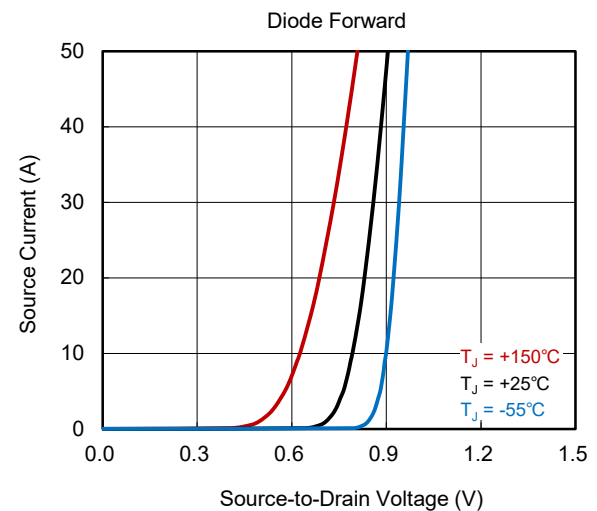
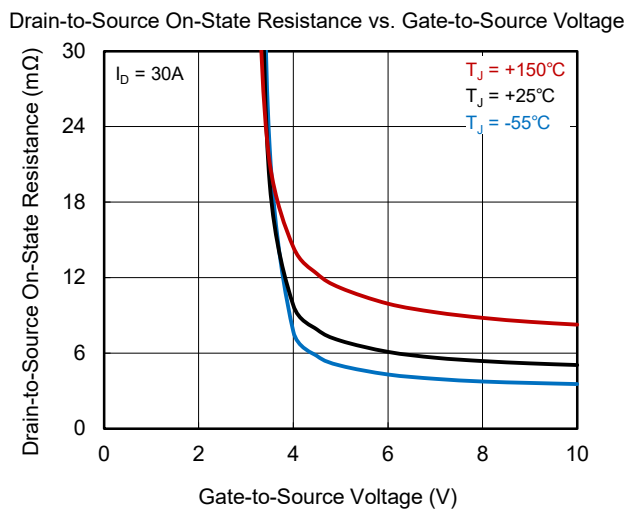
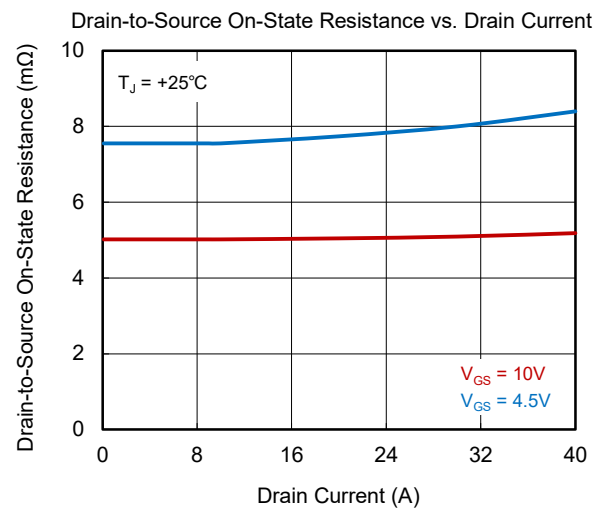
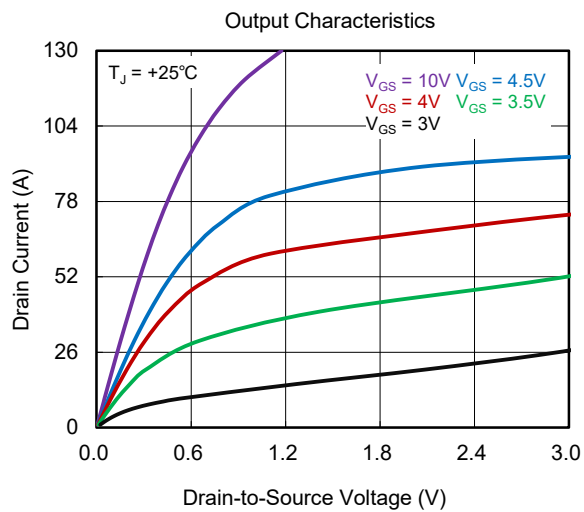
PARAMETER	SYMBOL	TYP	UNITS
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	49	°C/W

ELECTRICAL CHARACTERISTICS

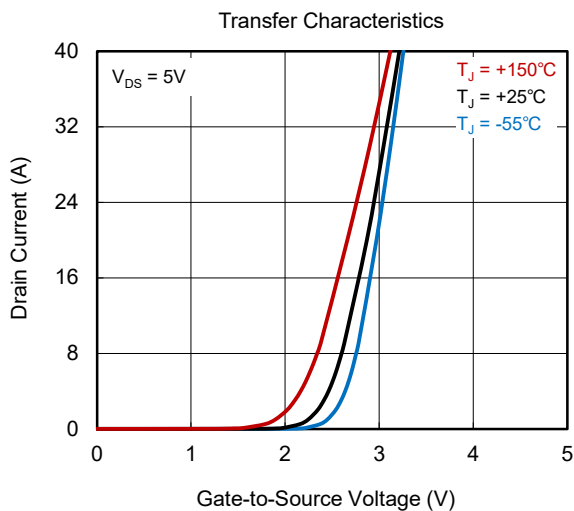
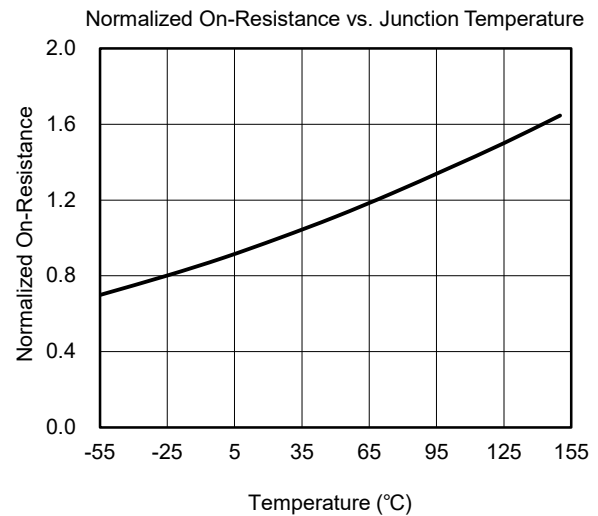
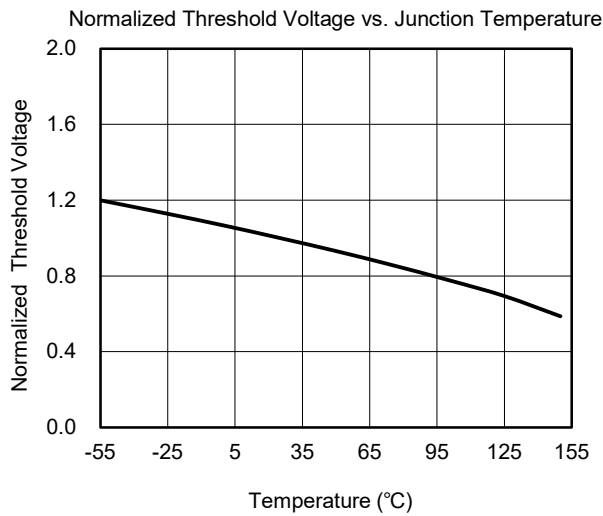
(T_A = +25°C, unless otherwise noted.)

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				1	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 _{DSON}	V _{GS} = 10V, I _D = 30A			5.1	6.4	mΩ
		V _{GS} = 4.5V, I _D = 20A			7.7	10	
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 20A			17		S
Gate Resistance	R _G	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz			1		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			22		ns
Reverse Recovery Charge	Q _{RR}				12		nC
Dynamic Characteristics							
Input Capacitance	C _{ISS}	V _{GS} = 0V, V _{DS} = 20V, f = 1MHz			805		pF
Output Capacitance	C _{OSS}				286		
Reverse Transfer Capacitance	C _{RSS}				26		
Total Gate Charge	Q _G	V _{DS} = 20V, I _D = 20A	V _{GS} = 10V		14.7		nC
			V _{GS} = 4.5V		7.4		
Gate-to-Source Charge	Q _{GS}	V _{DS} = 20V, V _{GS} = 4.5V, I _D = 20A			2.8		
Gate-to-Drain Charge	Q _{GD}				3.6		
Switch Characteristics							
Turn-On Delay Time	t _{D_ON}	V _{GS} = 10V, V _{DS} = 20V, I _D =20A, R _G = 3Ω			5.4		ns
Rise Time	t _R				28.6		
Turn-Off Delay Time	t _{D_OFF}				14.1		
Fall Time	t _F				4.5		

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

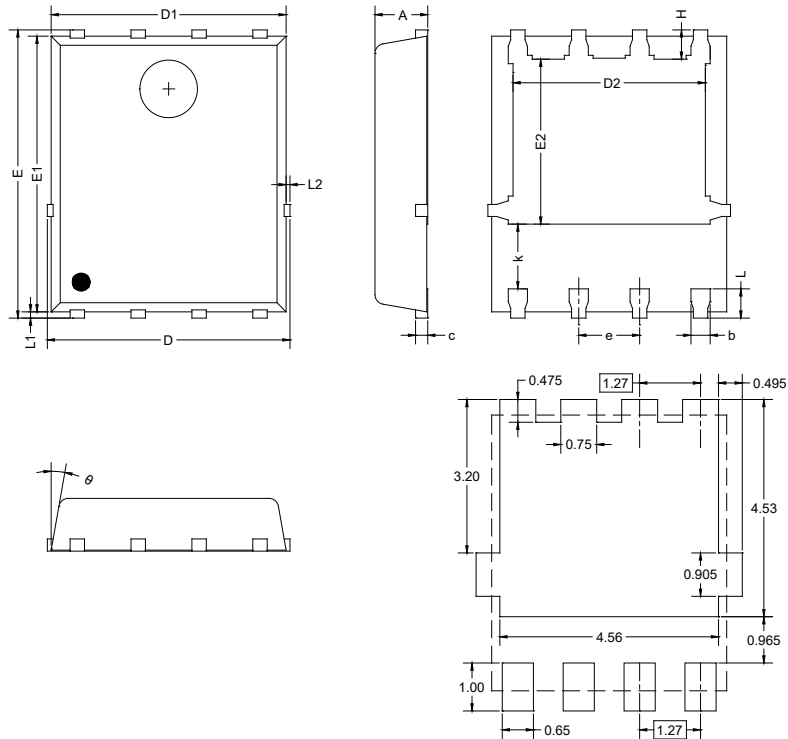
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Original to REV.A (NOVEMBER 2025)

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

PACKAGE OUTLINE DIMENSIONS

PDFN-5×6-8BL



RECOMMENDED LAND PATTERN (Unit: mm)

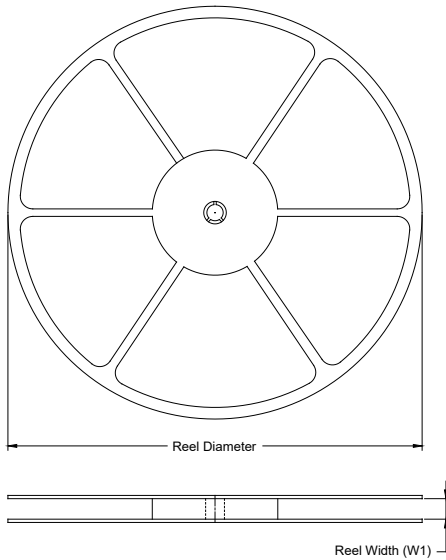
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	1.000	1.100	1.200
b	0.300	0.400	0.500
c	0.150	0.250	0.350
D	4.800	-	5.400
D1	4.800	4.900	5.000
D2	3.910	4.010	4.310
E	5.900	6.000	6.250
E1	5.650	5.750	5.850
E2	3.300	3.440	3.540
e	1.270 BSC		
H	0.350	0.610	0.710
k	1.100	-	-
L	0.380	0.610	0.710
L1	0.050	0.130	0.250
L2	-	-	0.220
θ	8°	10°	12°

NOTE: This drawing is subject to change without notice.

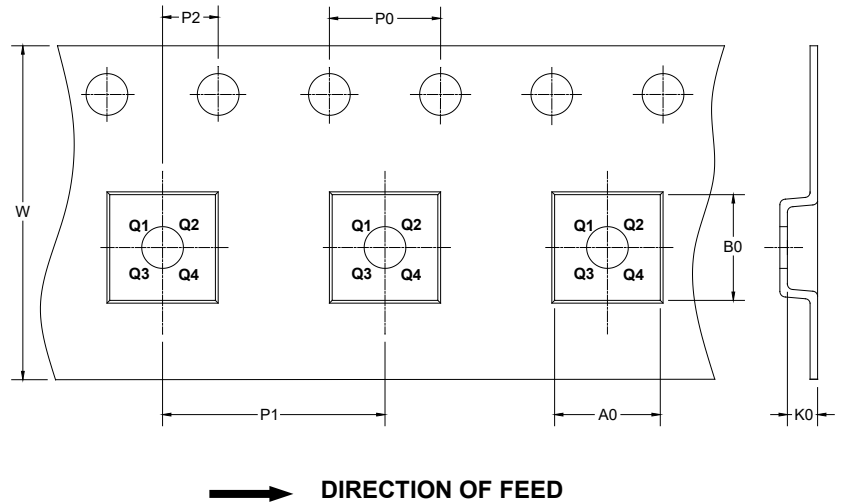
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

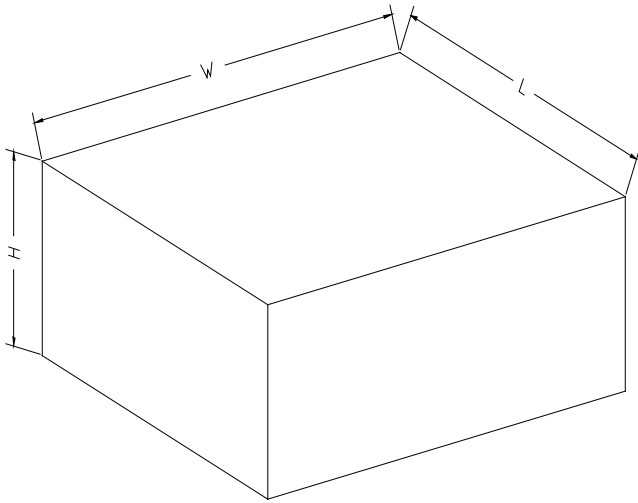
KEY PARAMETER LIST OF TAPE AND REEL

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-5×6-8BL	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