SGMQL56430
30V, Power, Single N-Channel, PDFN Package, MOSFET

FEATURES

- **Low Gate Threshold Voltage**
- **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}	30	V
Gate-to-Source Voltage		V_{GS}	±12	V
Drain Current (1) PDFN-5×6-8BL	T_C = +25℃	I_D	45	A
	T_C = +100℃		29	
	T_A = +25℃		13	
	T_A = +70℃		10	
Drain Current (1) PDFN-3.3×3.3-8AL	T_C = +25℃	I_D	43	A
	T_C = +100℃		27	
	T_A = +25℃		12	
	T_A = +70℃		9.8	
Drain Current (Pulse) (2) PDFN-5×6-8BL		I_{DM}	100	A
Drain Current (Pulse) (2) PDFN-3.3×3.3-8AL		I_{DM}	95	A
Total Dissipation PDFN-5×6-8BL	T_C = +25℃	P_D	31.2	W
	T_C = +100℃		12.5	
	T_A = +25℃		2.7	
	T_A = +70℃		1.7	
Total Dissipation PDFN-3.3×3.3-8AL	T_C = +25℃	P_D	27.7	W
	T_C = +100℃		11	
	T_A = +25℃		2.2	
	T_A = +70℃		1.4	
Avalanche Current (3)		I_{AS}	26	A
Avalanche Energy (3)		E_{AS}	33.8	mJ
Junction Temperature		T_J	+150	℃
Storage Temperature Range		T_{STG}	-55 to +150	℃
Lead Temperature (Soldering, 10s)			+260	℃

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:

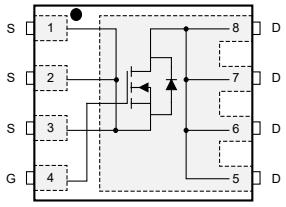
1. The current will be limited by package, PCB, thermal design and operating temperature.
2. t_{PULSE} < 10μs.
3. Parts are 100% tested at V_{GS} = 10V, I_L = 18.4A, and E_{AS} = 16.9mJ.

PRODUCT SUMMARY

PACKAGE	R_{DSON} (TYP) V_{GS} = 4.5V	R_{DSON} (MAX) V_{GS} = 4.5V	I_D (MAX) T_C = +25℃
PDFN-5×6-8BL	5.6mΩ	7mΩ	45A
PDFN-3.3×3.3-8AL	5.6mΩ	7mΩ	43A

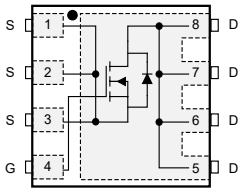
PIN CONFIGURATIONS

(TOP VIEW)



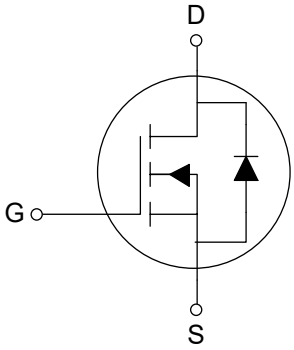
PDFN-5×6-8BL

(TOP VIEW)



PDFN-3.3×3.3-8AL

EQUIVALENT CIRCUIT



APPLICATIONS

VBUS OVP Switch

Battery Charging and Discharging Switch

AMOLED Controller Application

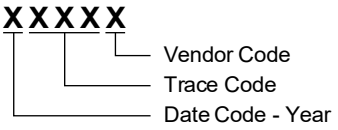
On-Board DC/DC Solutions for Server and Telecommunications

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMQL56430	PDFN-5×6-8BL	-55℃ to +150℃	SGMQL56430TPDA8G/TR	SGM21B TPDA8 XXXXX	Tape and Reel, 4000
	PDFN-3.3×3.3-8AL	-55℃ to +150℃	SGMQL56430TPDB8G/TR	SGM21C TPDB8 XXXXX	Tape and Reel, 5000

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

PARAMETER		SYMBOL	TYP	UNITS
Junction-to-Case Thermal Resistance	PDFN-5×6-8BL	$R_{\theta JC}$	4	℃/W
	PDFN-3.3×3.3-8AL		4.5	
Junction-to-Ambient Thermal Resistance (1)	PDFN-5×6-8BL	$R_{\theta JA}$	46	℃/W
	PDFN-3.3×3.3-8AL		56	

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

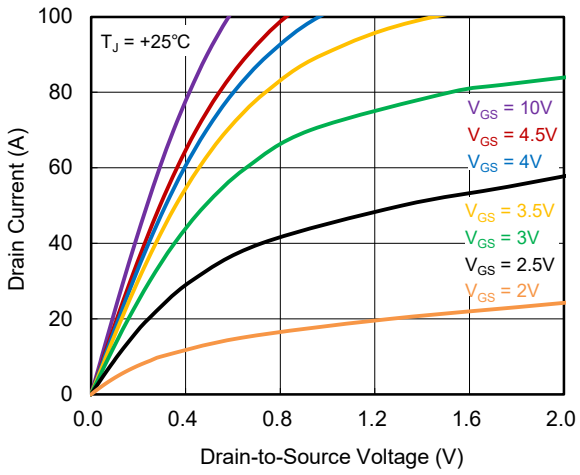
ELECTRICAL CHARACTERISTICS

(T_A = +25℃, unless otherwise noted.)

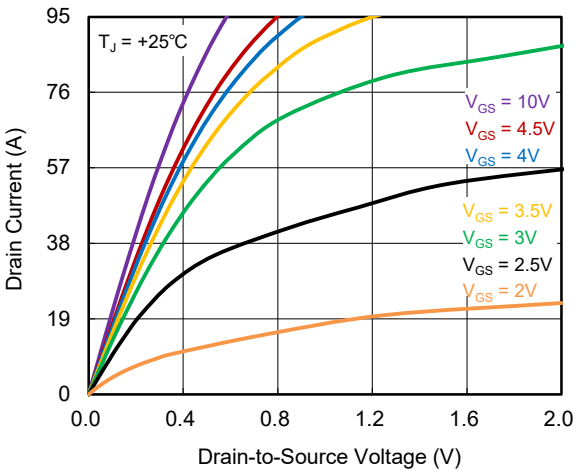
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Static OFF Characteristics						
Drain-to-Source Breakdown Voltage	V_{BR_DSS}	V_{GS} = 0V, I_D = 250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0V, V_{DS} = 24V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS} = ±12V, V_{DS} = 0V			±100	nA
Static ON Characteristics						
Gate-to-Source Threshold Voltage	V_{GS_TH}	V_{GS} = V_{DS}, I_D = 250μA	0.6	1	1.5	V
Drain-to-Source On-State Resistance	R_{DSON}	V_{GS} = 10V, I_D = 30A		4.6	5.9	mΩ
		V_{GS} = 4.5V, I_D = 20A		5.6	7	
		V_{GS} = 2.5V, I_D = 10A		13.5	25	
Forward Transconductance	g_{FS}	V_{DS} = 5V, I_D = 15A		19		S
Gate Resistance	R_G	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.2		Ω
Diode Characteristics						
Diode Forward Voltage	V_{F_SD}	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		24		ns
Reverse Recovery Charge	Q_{RR}			17		nC
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		803		pF
Output Capacitance	C_{OSS}			474		
Reverse Transfer Capacitance	C_{RSS}			35		
Total Gate Charge	Q_G	V_{GS} = 4.5V, V_{DS} = 15V, I_D = 20A		7.5		nC
Gate-to-Source Charge	Q_{GS}			2		
Gate-to-Drain Charge	Q_{GD}			2.7		
Switch Characteristics						
Turn-On Delay Time	t_{D_ON}	V_{GS} = 4.5V, V_{DS} = 15V, I_D = 20A, R_G = 3Ω		6		ns
Rise Time	t_R			69		
Turn-Off Delay Time	t_{D_OFF}			11		
Fall Time	t_F			5		

TYPICAL PERFORMANCE CHARACTERISTICS

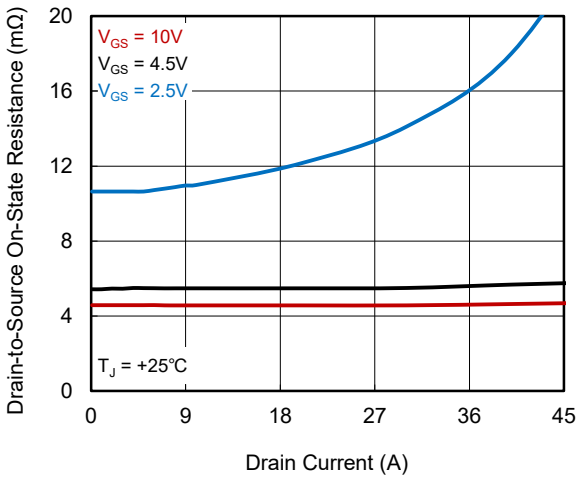
Output Characteristics (PDFN-5×6-8BL)



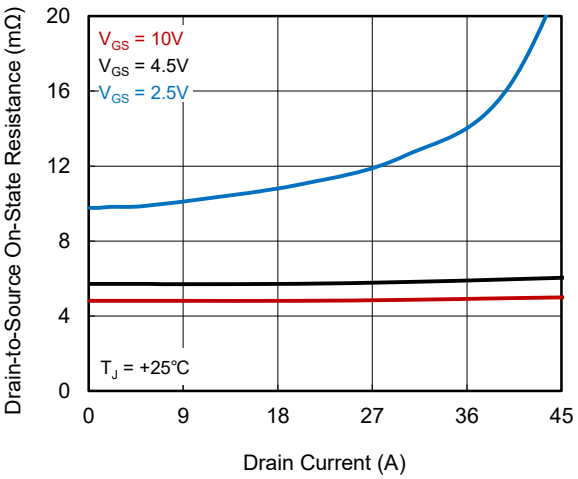
Output Characteristics (PDFN-3.3×3.3-8AL)



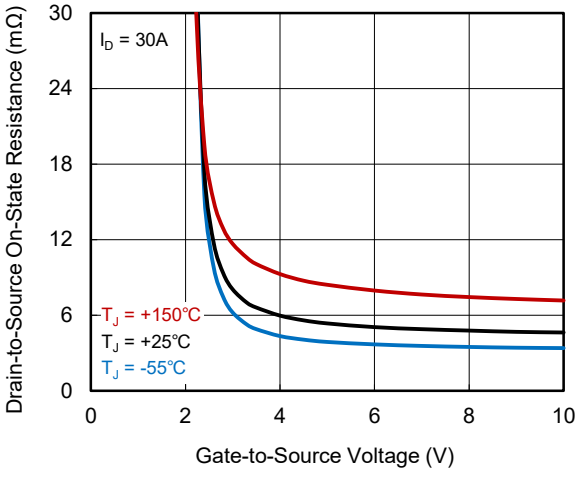
Drain-to-Source On-State Resistance vs. I_D (PDFN-5×6-8BL)



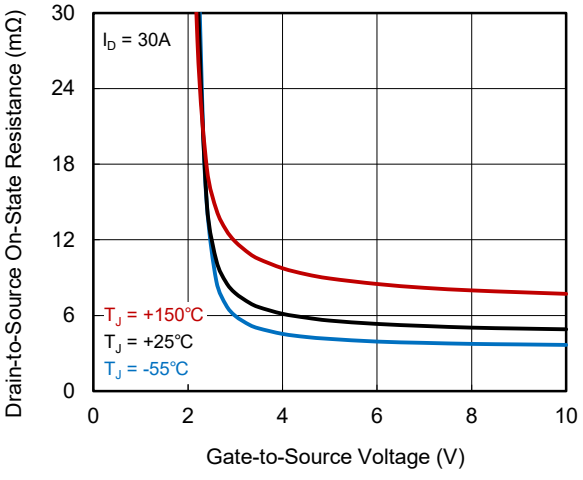
Drain-to-Source On-State Resistance vs. I_D (PDFN-3.3×3.3-8AL)



Drain-to-Source On-State Resistance vs. V_{GS} (PDFN-5×6-8BL)

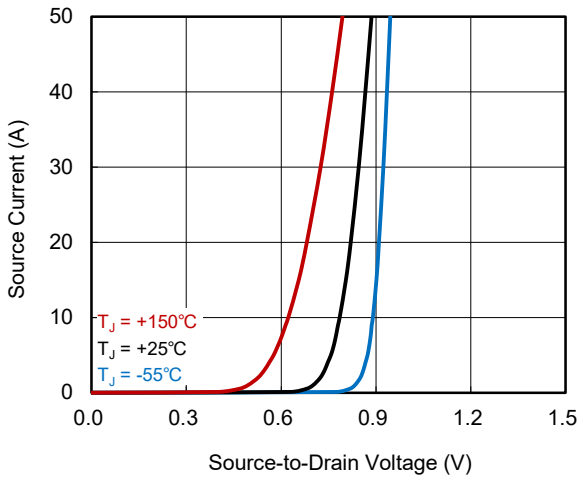


Drain-to-Source On-State Resistance vs. V_{GS} (PDFN-3.3×3.3-8AL)

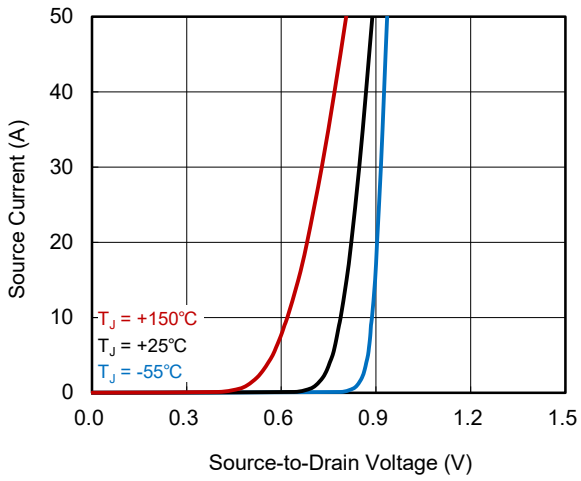


TYPICAL PERFORMANCE CHARACTERISTICS (continued)

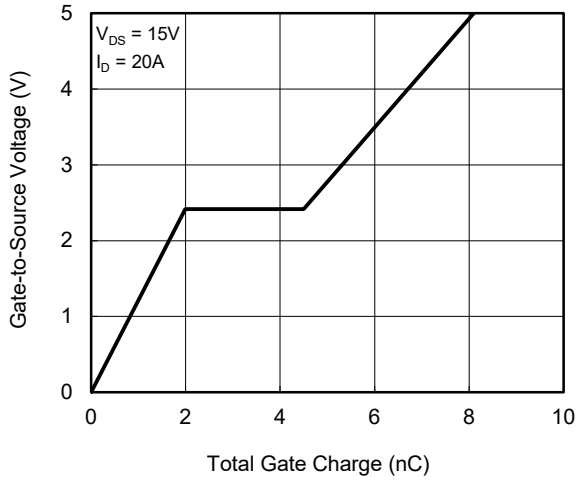
Diode Forward (PDFN-5×6-8BL)



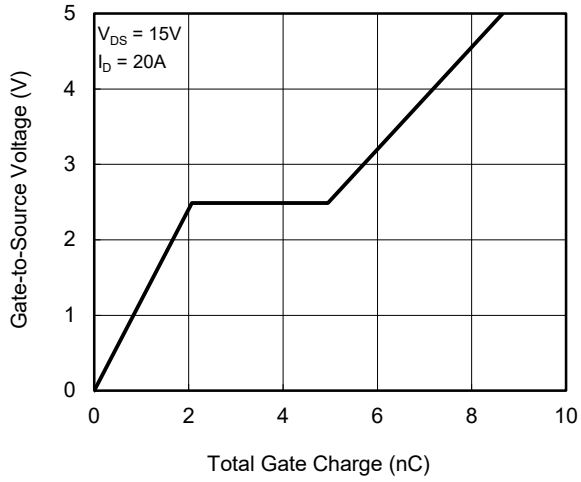
Diode Forward (PDFN-3.3×3.3-8AL)



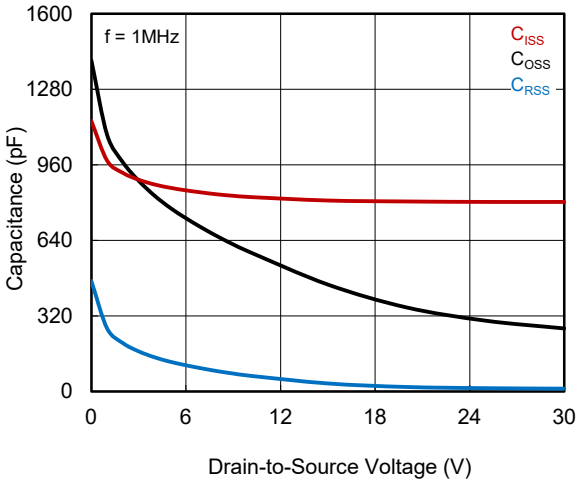
Gate Charge Characteristics (PDFN-5×6-8BL)



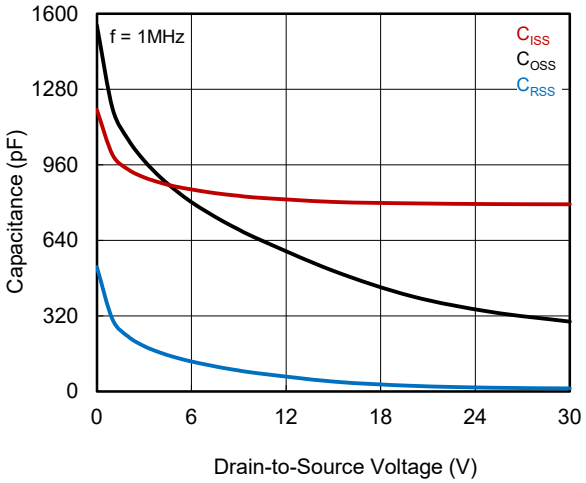
Gate Charge Characteristics (PDFN-3.3×3.3-8AL)



Capacitance Characteristics (PDFN-5×6-8BL)

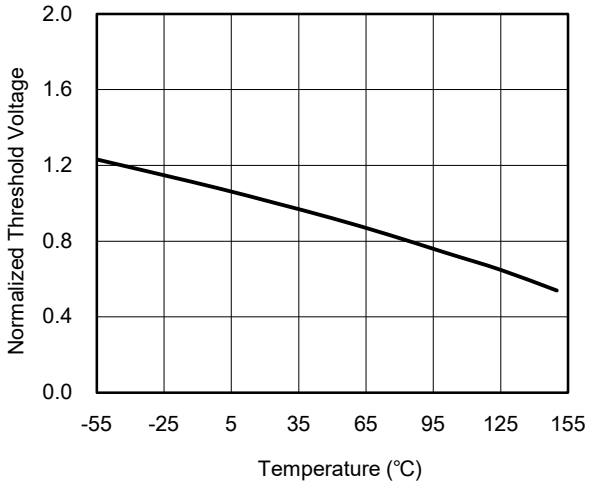


Capacitance Characteristics (PDFN-3.3×3.3-8AL)

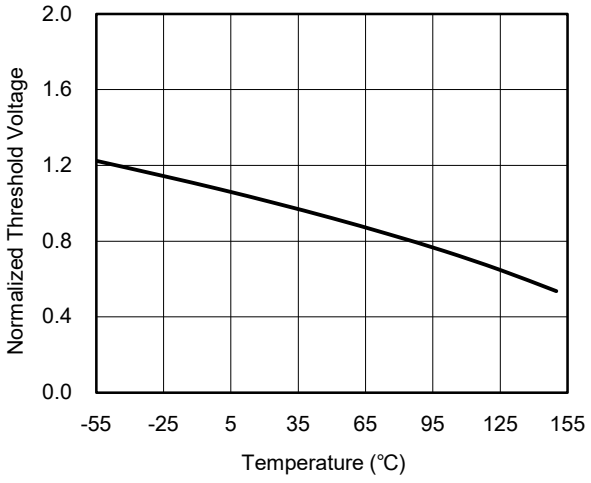


TYPICAL PERFORMANCE CHARACTERISTICS (continued)

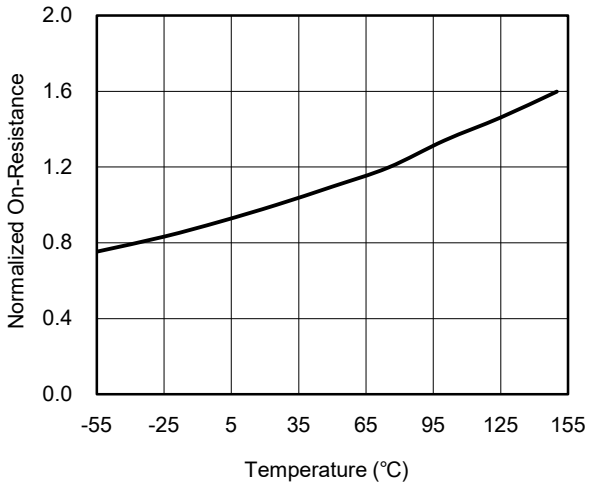
Normalized Threshold Voltage vs. Temperature (PDFN-5×6-8BL)



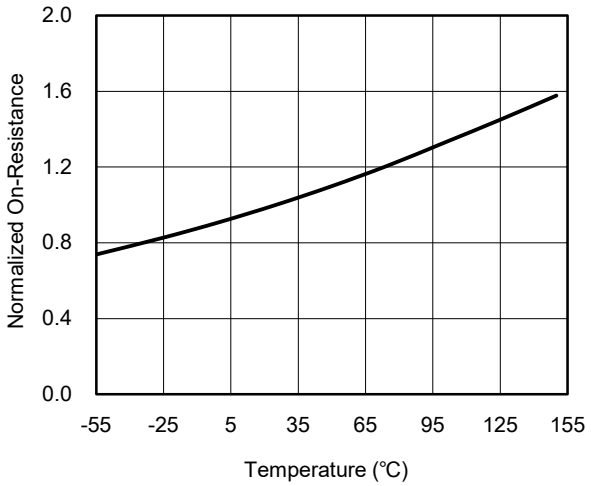
Normalized Threshold Voltage vs. Temperature (PDFN-3.3×3.3-8AL)



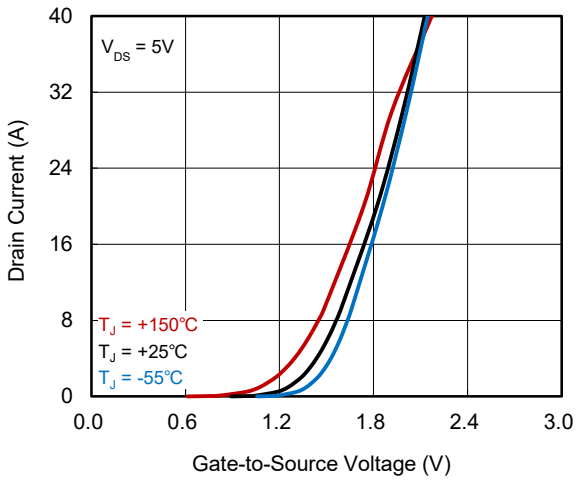
Normalized On-Resistance vs. Temperature (PDFN-5×6-8BL)



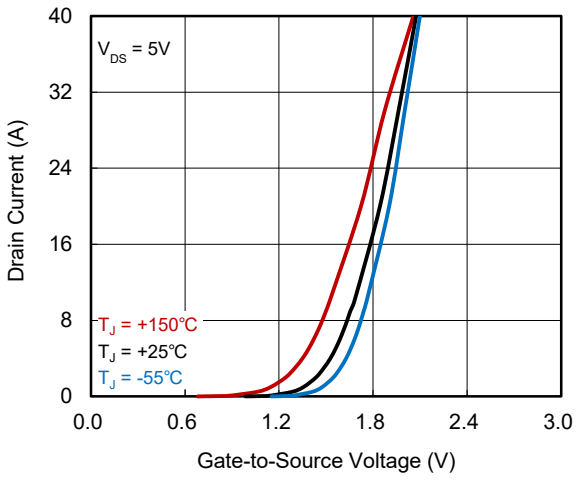
Normalized On-Resistance vs. Temperature (PDFN-3.3×3.3-8AL)



Transfer Characteristics (PDFN-5×6-8BL)

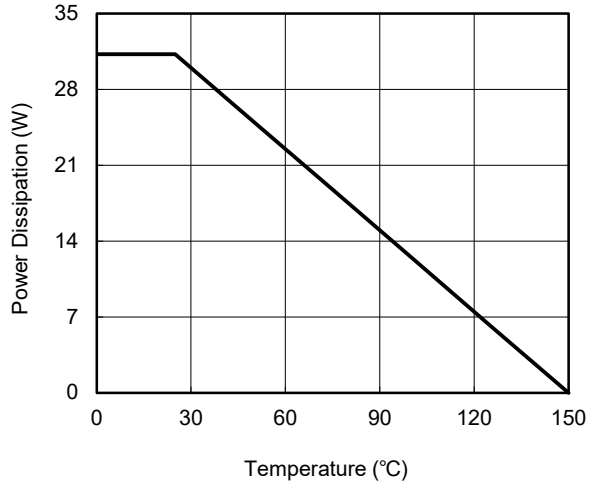


Transfer Characteristics (PDFN-3.3×3.3-8AL)

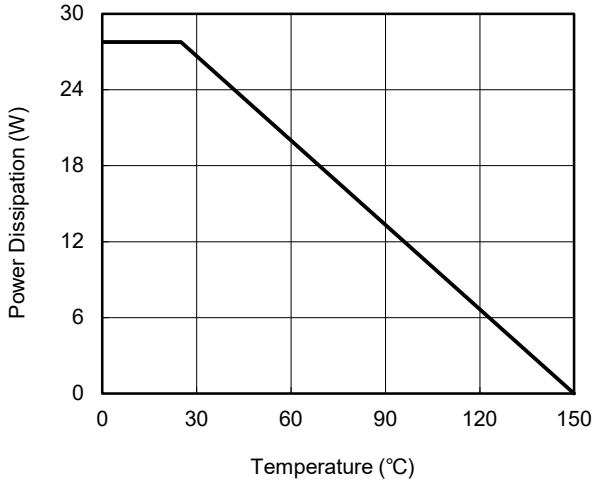


TYPICAL PERFORMANCE CHARACTERISTICS (continued)

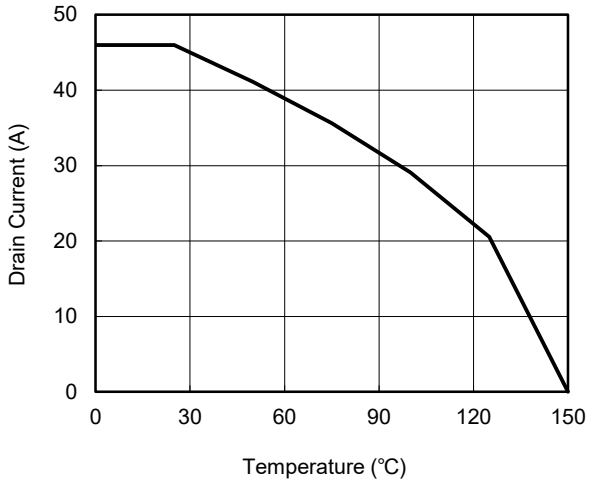
Power Dissipation vs. T_J (PDFN-5×6-8BL)



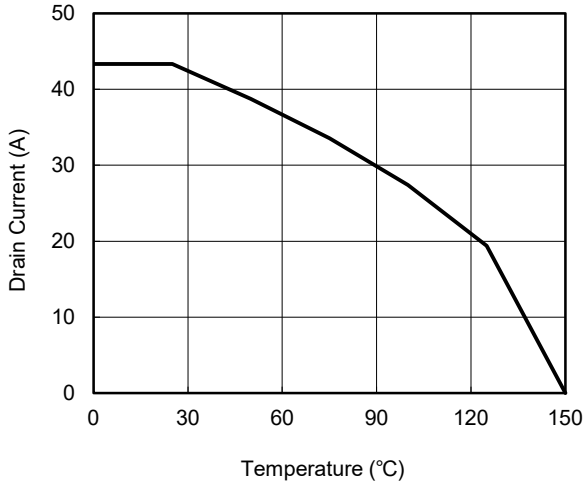
Power Dissipation vs. T_J (PDFN-3.3×3.3-8AL)



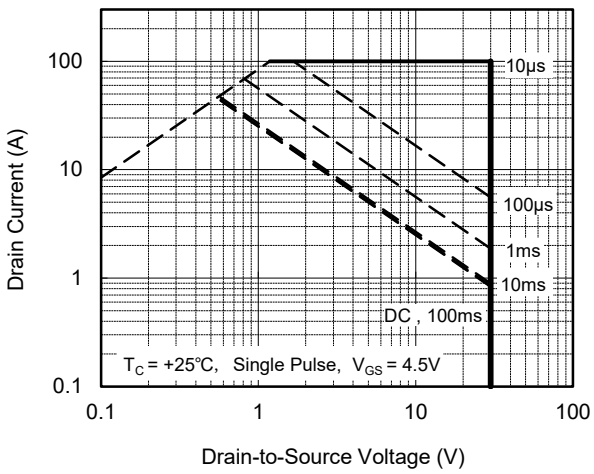
Drain Current vs. T_J (PDFN-5×6-8BL)



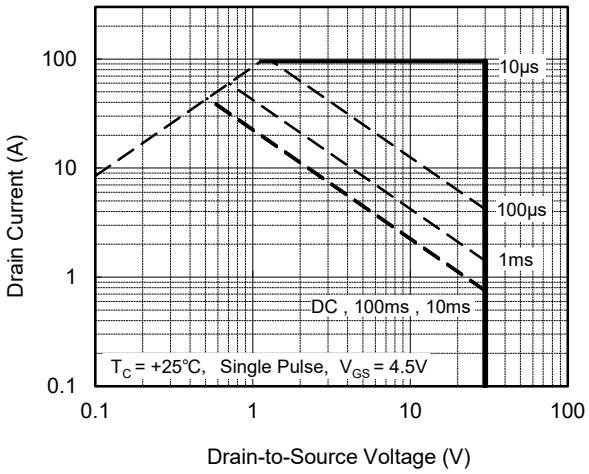
Drain Current vs. T_J (PDFN-3.3×3.3-8AL)



Safe Operating Area (PDFN-5×6-8BL)

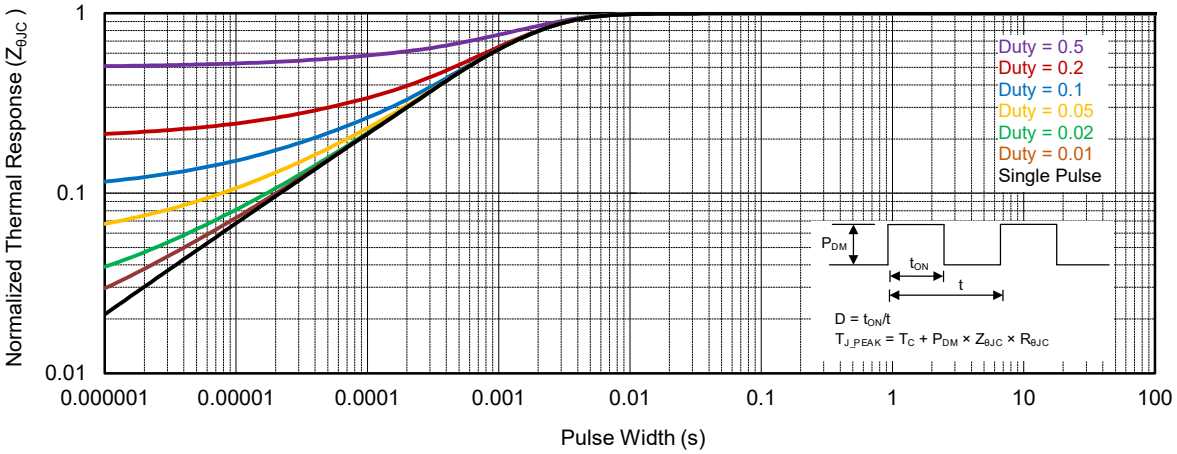


Safe Operating Area (PDFN-3.3×3.3-8AL)

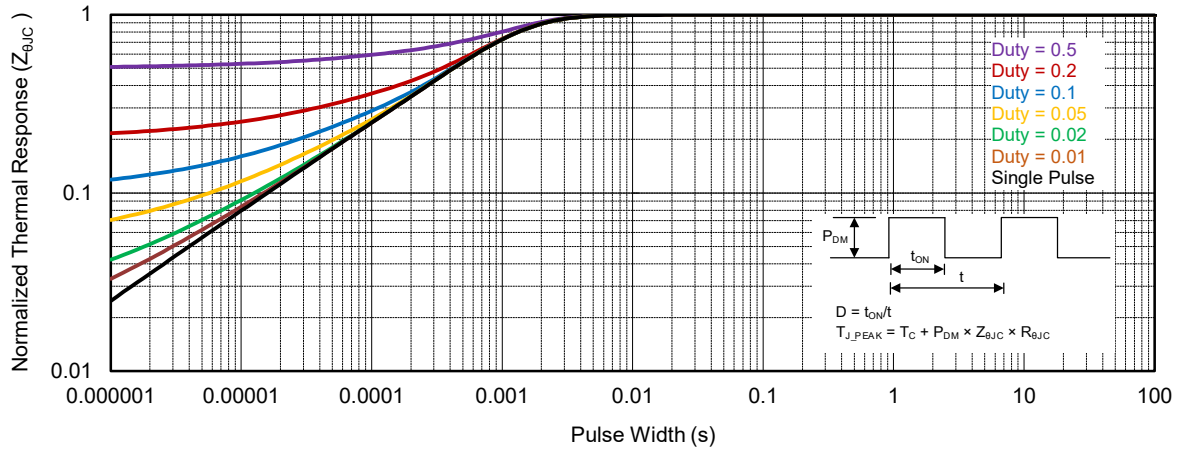


TYPICAL PERFORMANCE CHARACTERISTICS (continued)

Transient Thermal Impedance (PDFN-5×6-8BL)



Transient Thermal Impedance (PDFN-3.3×3.3-8AL)



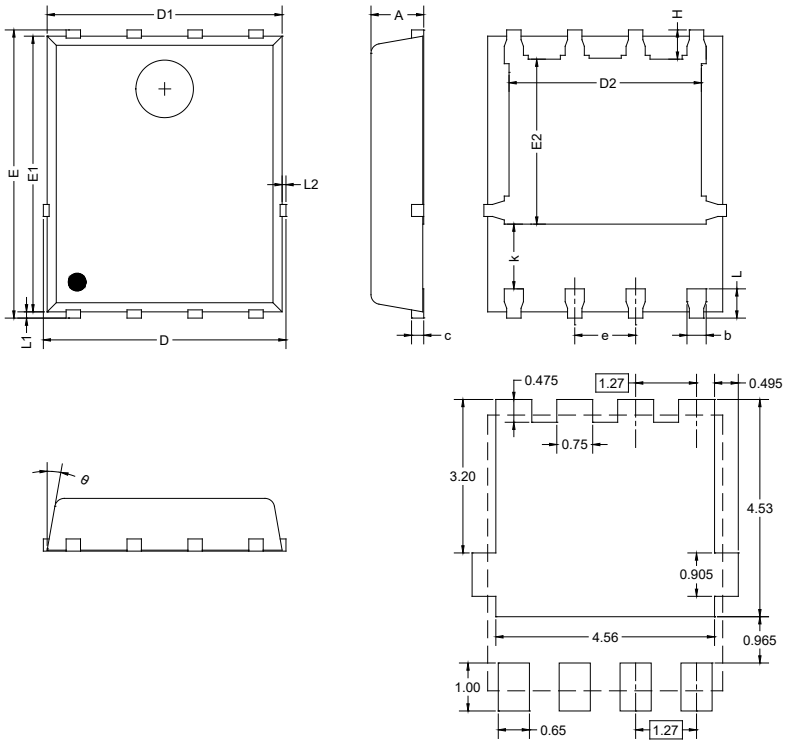
REVISION HISTORY

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

Changes from Original to REV.A (MARCH 2026)	Page
Changed from product preview to production data	All

PACKAGE OUTLINE DIMENSIONS

PDFN-5×6-8BL



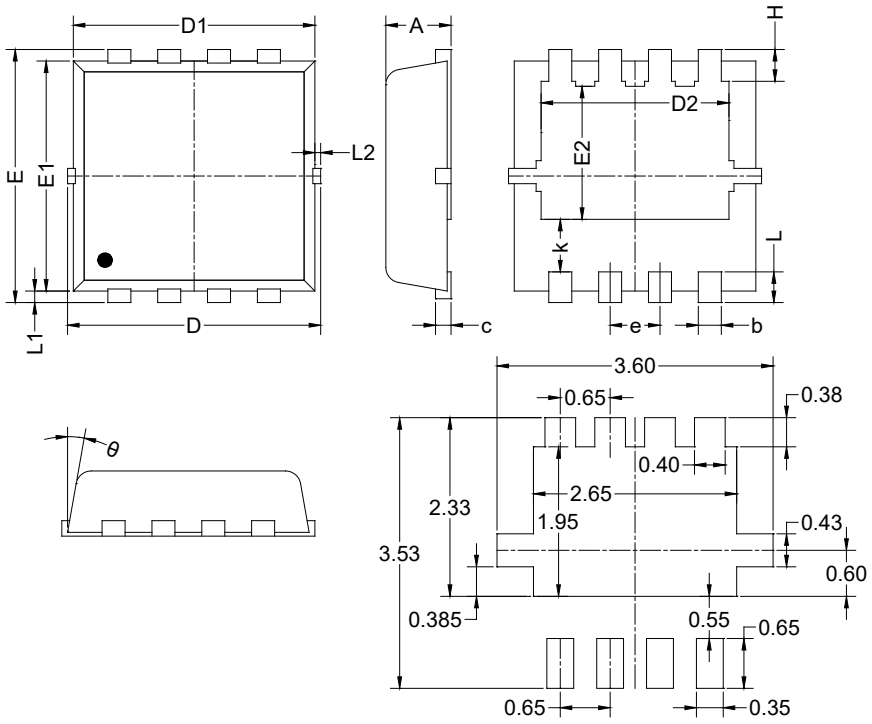
RECOMMENDED LAND PATTERN (Unit: mm)

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 OUTLINE DIMENSIONS

PDFN-3.3×3.3-8AL



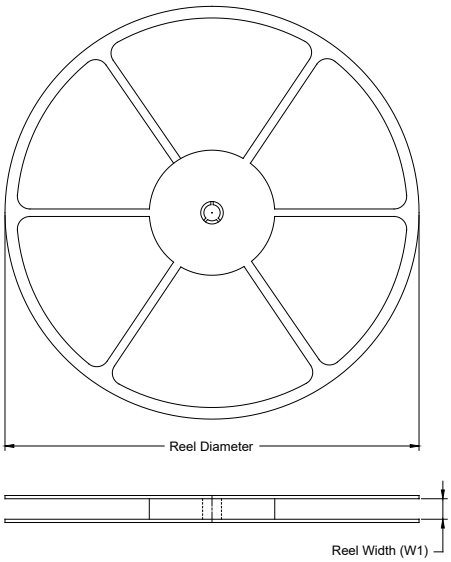
RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.700	0.800	0.900
b	0.250	0.300	0.350
c	0.140	0.150	0.200
D	3.100	3.300	3.500
D1	3.050	3.150	3.250
D2	2.350	2.450	2.550
E	3.100	3.300	3.500
E1	2.900	3.000	3.100
E2	1.640	1.740	1.840
e	0.650 BSC		
H	0.320	0.420	0.520
k	0.590	0.690	0.790
L	0.250	0.400	0.550
L1	0.100	0.150	0.200
L2	-	-	0.150
θ	8°	10°	12°

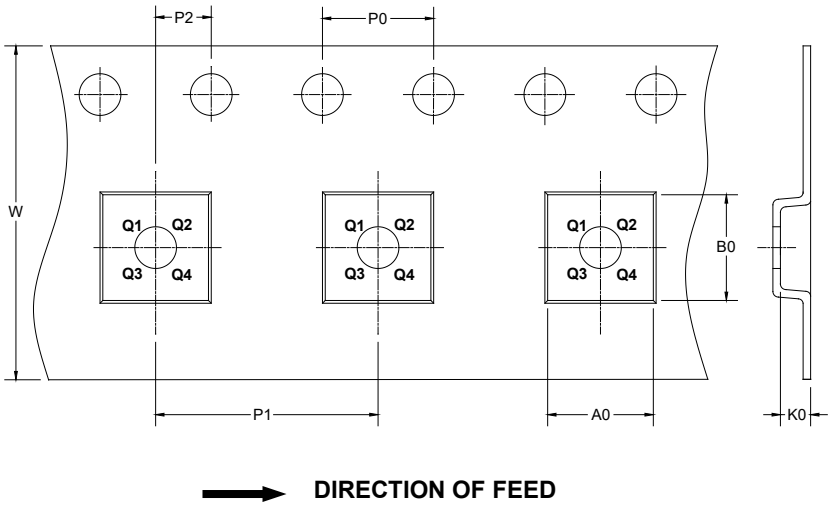
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



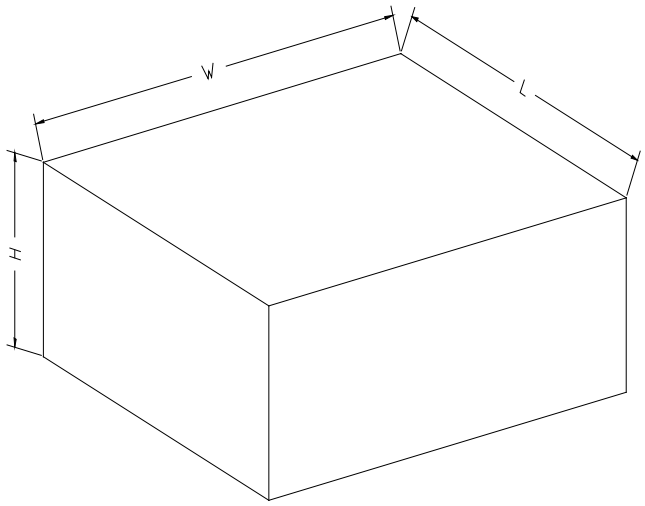
NOTE: The picture is only for reference. Please make the object as the standard.

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
PDFN-5×6-8BL	13"	12.4	6.45	5.30	1.40	4.0	8.0	2.0	12.0	Q1
PDFN-3.3×3.3-8AL	13"	12.4	3.60	3.60	1.10	4.0	8.0	2.0	12.0	Q1

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
13″	386	280	370	5

DD0002