

Features

- Advanced trench technology
- Low on-resistance
- Reliable and Rugged
- Green device available

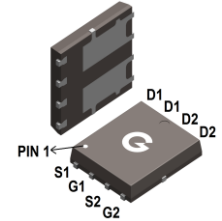
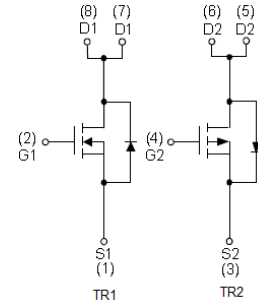
Applications

- Synchronous Rectification
- Motor Control
- Portable equipment application

Mechanical Data

- Case: PDFN5x6-8LC
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

HF



PDFN5×6-8LC

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
GBLH3303-5DL8	PDFN5x6-8LC	5000 pcs / Tape & Reel	GBLH3303

Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	N Channel	P Channel	Unit
Drain-to-Source Voltage	V_{DSS}	30	-30	V
Gate-to-Source Voltage	V_{GSS}	± 20	± 20	V
Continuous Drain Current ($T_C = 25^\circ\text{C}$)	I_D	25	-20	A
Continuous Drain Current ($T_A = 25^\circ\text{C}$) ^{*1}		7.7	-6.2	A
Continuous Drain Current ($T_A = 100^\circ\text{C}$) ^{*1}		5	-4	A
Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_A = 25^\circ\text{C}$)	I_{DM}	70	-60	A
Single Pulse Avalanche Energy ^{*3}	E_{AS}	16	30	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	21		W
Power Dissipation ($T_A = 25^\circ\text{C}$) ^{*1}		2		W
Operating Junction Temperature Range	T_J	-55 ~ +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150		$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	-	6	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	-	-	62	$^\circ\text{C/W}$

Electrical Characteristics-N (@ T_A = 25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 30V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = 10V, I _D = 6.5A	-	18	20	mΩ
		V _{GS} = 4.5V, I _D = 6A	-	24	30	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1	1.5	2.5	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	5.9	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 15V f = 1.0MHz	-	481	-	pF
C _{OSS}	Output Capacitance		-	70	-	
C _{RSS}	Reverse Transfer Capacitance		-	61	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time *4	V _{GS} = 10V V _{DD} = 15V I _D = 10A R _G = 3Ω	-	1.6	-	ns
t _r	Turn-on Rise Time *4		-	25.6	-	
t _{d(OFF)}	Turn-Off Delay Time *4		-	16.6	-	
t _f	Turn-Off Fall Time *4		-	9	-	
Q _G	Total Gate-Charge	V _{DD} = 15V V _{GS} = 10V I _D = 10A	-	10.3	-	nC
Q _{GS}	Gate to Source Charge		-	1.3	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	3.2	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _{SD} = 20A, V _{GS} = 0V	-	1.0	1.4	V
t _{rr}	Reverse Recovery Time	I _{SD} = 10A, V _{GS} = 0V di/dt = 100A/μs	-	92	-	ns
Q _{rr}	Reverse Recovery Charge		-	52	-	nC

Electrical Characteristics-P (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -30V, V _{GS} = 0V	-	-	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = -10V, I _D = -5.7A	-	28	34	mΩ
		V _{GS} = -4.5V, I _D = -4.4A	-	39	50	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-1	-1.5	-2.5	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	8	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = -15V f = 1.0MHz	-	916	-	pF
C _{OSS}	Output Capacitance		-	112	-	
C _{RSS}	Reverse Transfer Capacitance		-	101	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time *4	V _{GS} = -10V V _{DD} = -15V I _D = -7A R _G = 2.5Ω	-	11	-	ns
t _r	Turn-on Rise Time *4		-	19	-	
t _{d(OFF)}	Turn-Off Delay Time *4		-	45	-	
t _f	Turn-Off Fall Time *4		-	26	-	
Q _G	Total Gate-Charge	V _{GS} = -10V V _{DD} = -15V I _D = -4A	-	20	-	nC
Q _{GS}	Gate to Source Charge		-	2.6	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	3.3	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _{SD} = -20A, V _{GS} = 0V	-	-1.1	-1.4	V

Notes:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper
- The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
- The E_{AS} data shows Max. rating. N: The test condition is V_{DD} = 20V, V_{GS} = 10V, L = 0.5mH
P: The test condition is V_{DD} = -20V, V_{GS} = -10V, L = 0.5mH
- Guaranteed by design, not subject to production

Ratings and Characteristics Curves-N (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

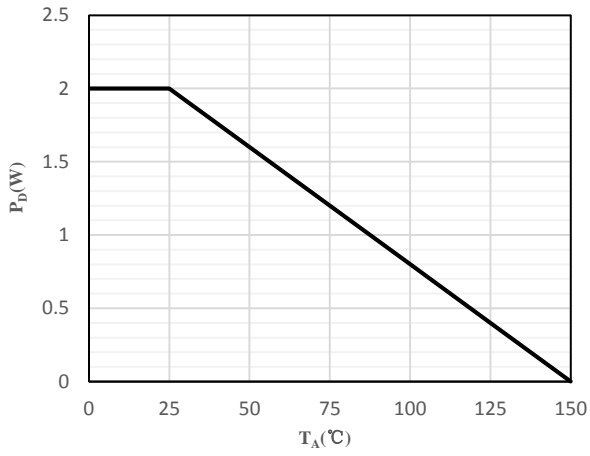


Fig 1 Power Dissipation

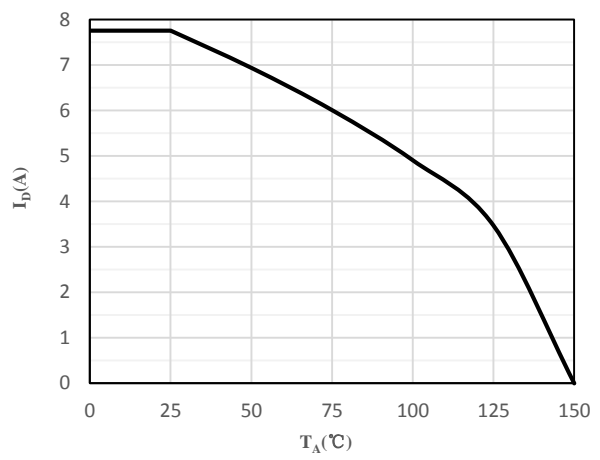


Fig 2 Drain Current

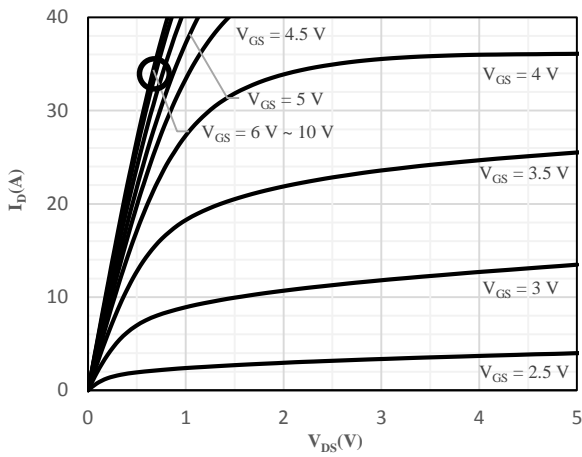


Fig 3 Typical Output Characteristics

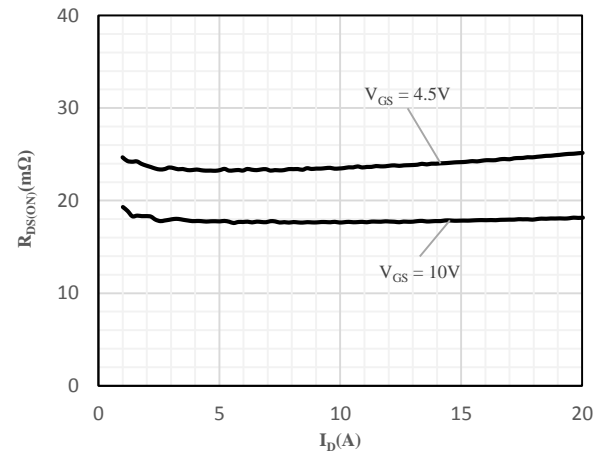


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

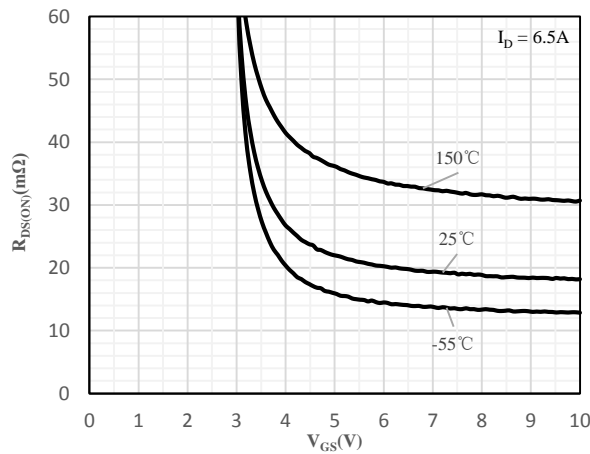


Fig 5 On-Resistance vs. Gate-Source Voltage

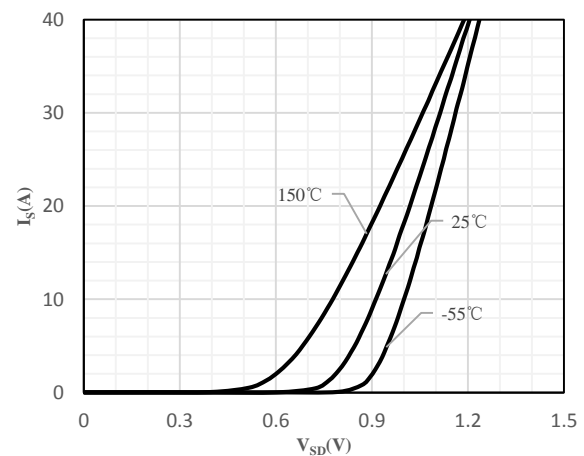


Fig 6 Body-Diode Characteristics

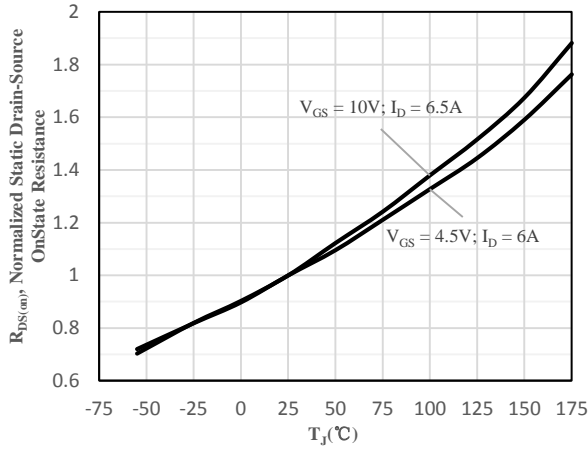


Fig 7 Normalized On-Resistance vs. Junction Temperature

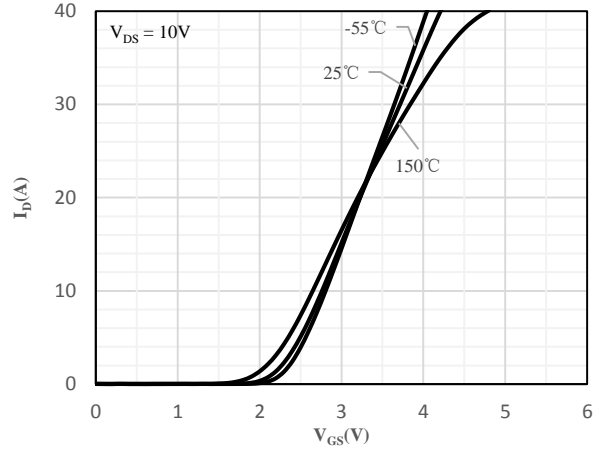


Fig 8 Transfer Characteristics

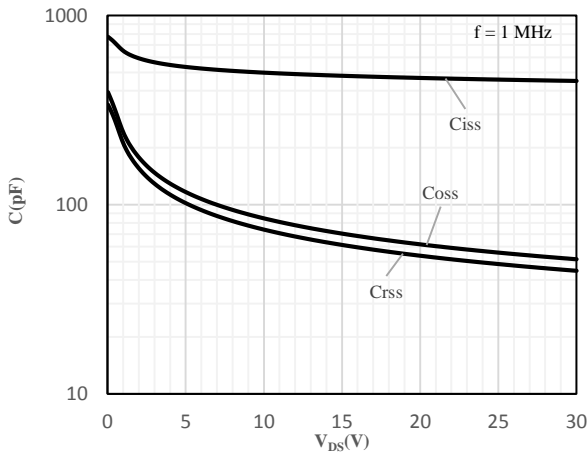


Fig 9 Capacitance Characteristics

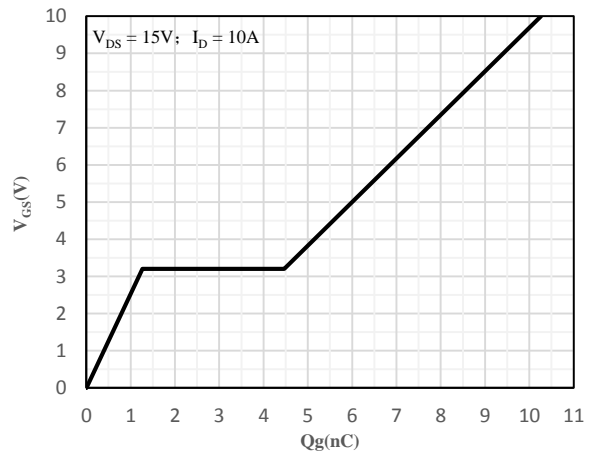


Fig 10 Gate-Charge Characteristics

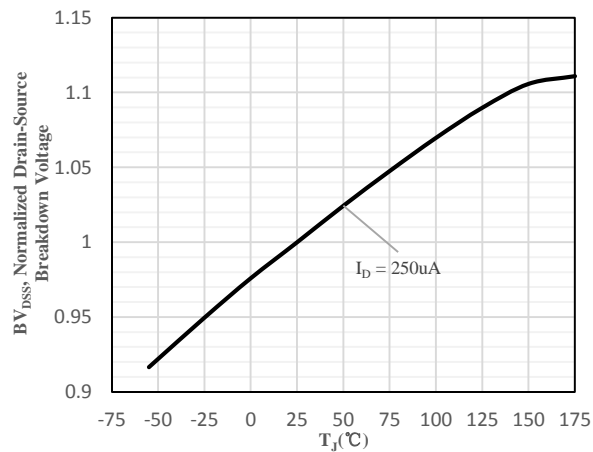


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

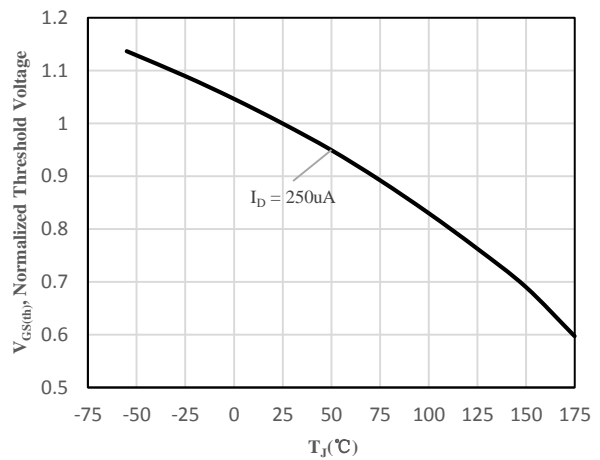


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

Ratings and Characteristics Curves-P (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

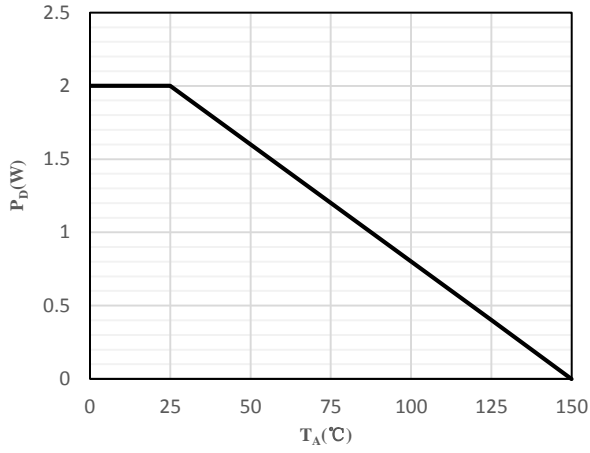


Fig 1 Power Dissipation

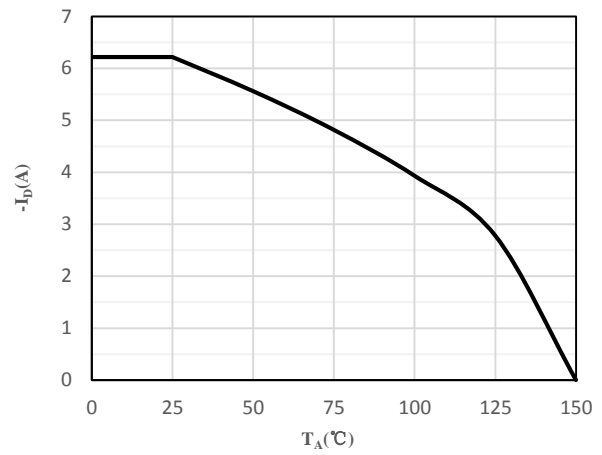


Fig 2 Drain Current

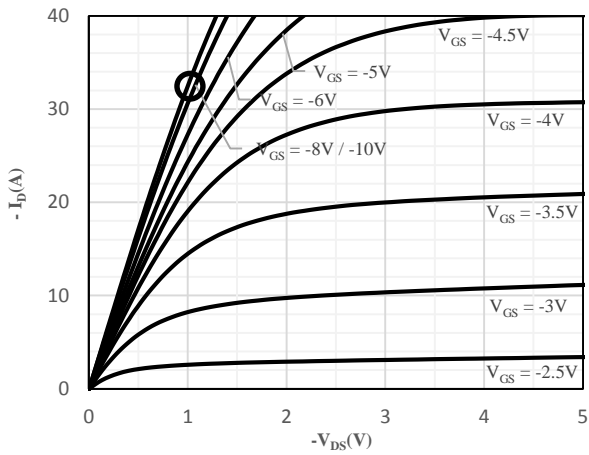


Fig 3 Typical Output Characteristics

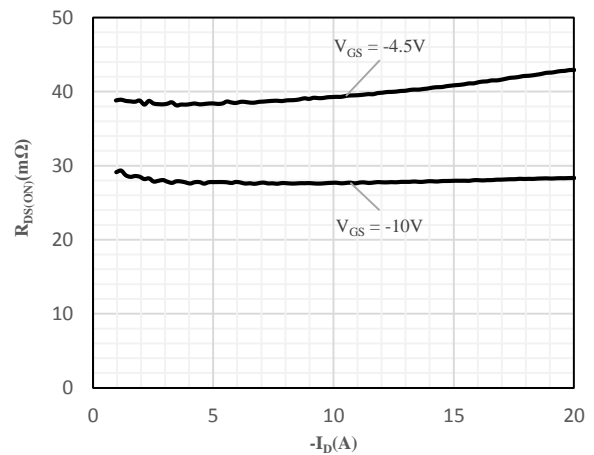


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

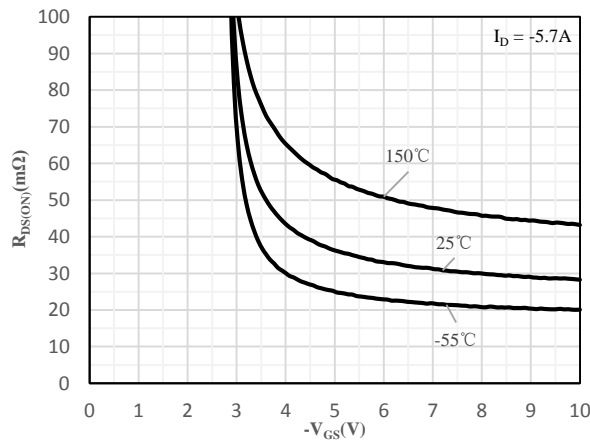


Fig 5 On-Resistance vs. Gate-Source Voltage

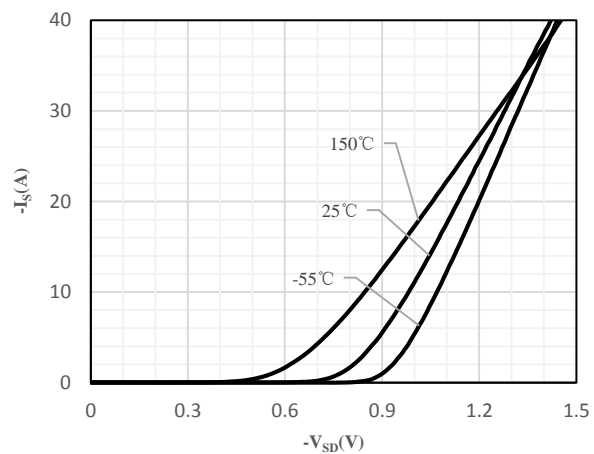


Fig 6 Body-Diode Characteristics

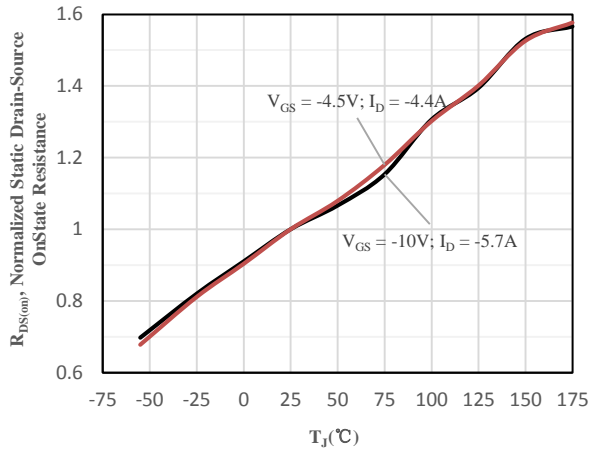


Fig 7 Normalized On-Resistance vs. Junction Temperature

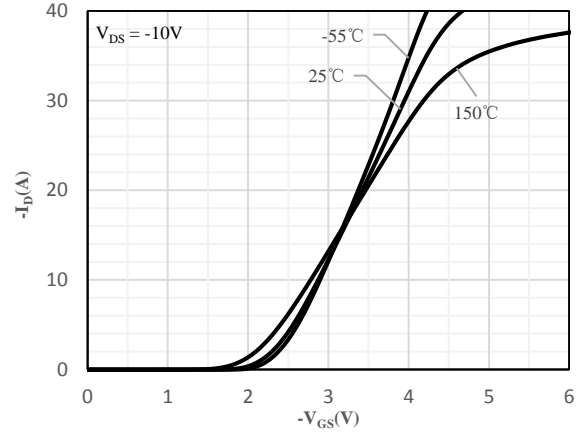


Fig 8 Transfer Characteristics

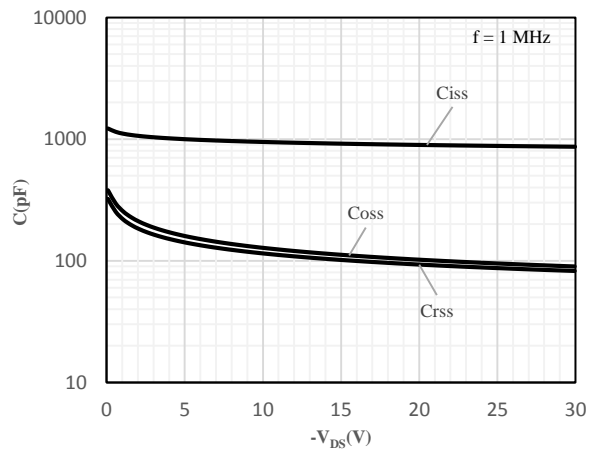


Fig 9 Capacitance Characteristics

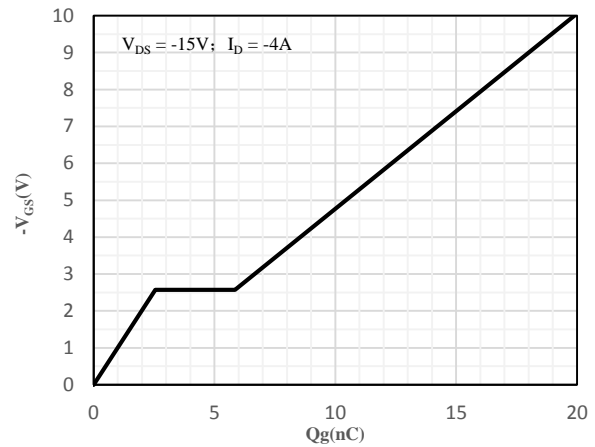


Fig 10 Gate-Charge Characteristics

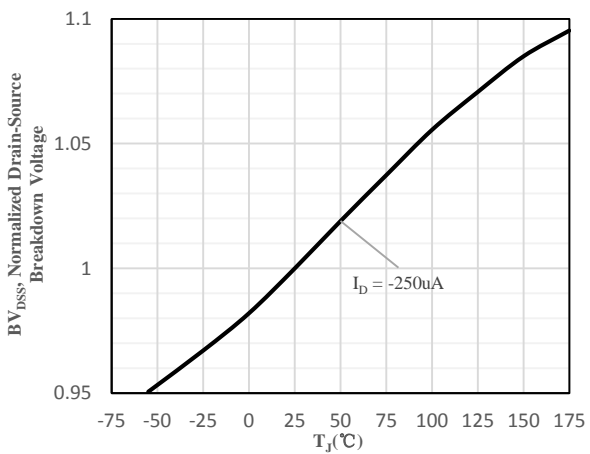


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

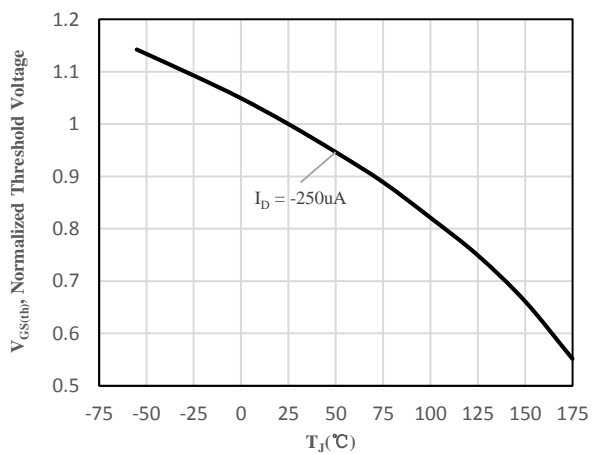
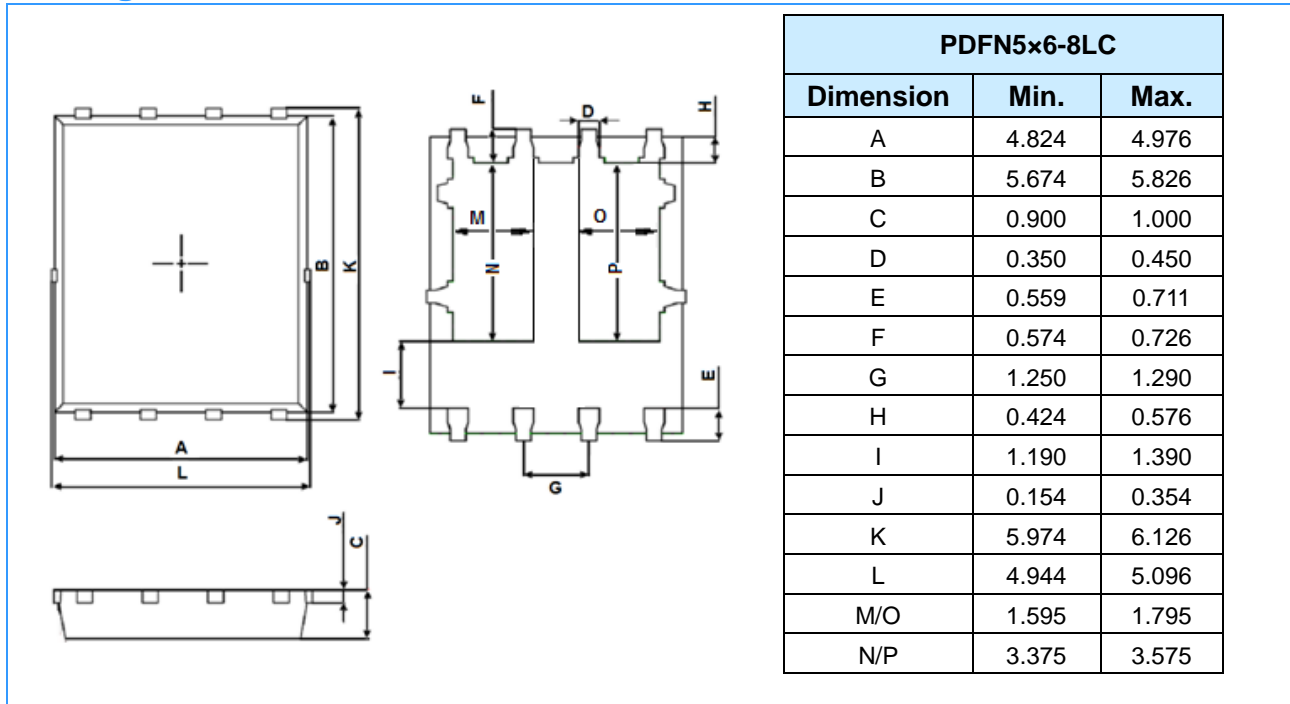
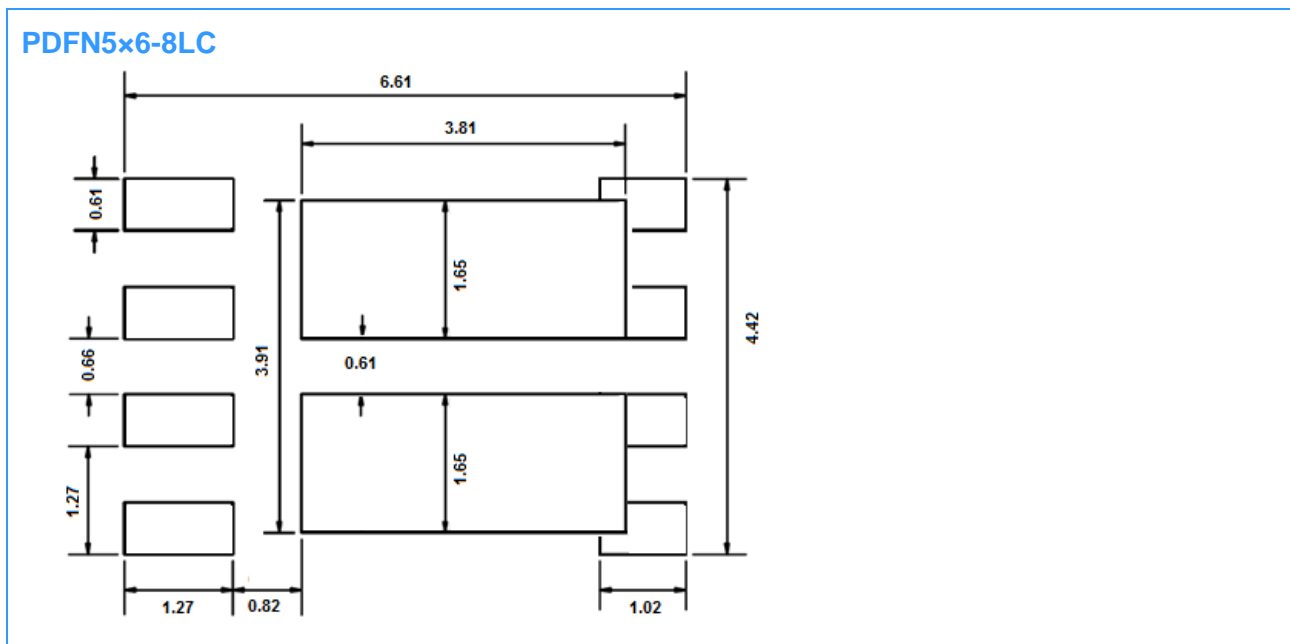


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)



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