Features

- Advanced trench technology
- Fast switching speed
- Green device available
- RoHS compliant with Halogen-free

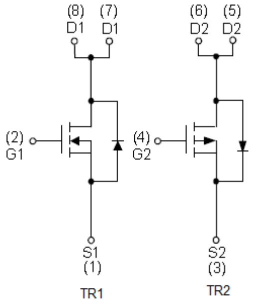
HF

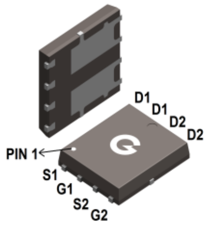
Applications

- Synchronous Rectification
- Motor Control
- Portable equipment application

Mechanical Data

- Case: PDFN5×6-8LC
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208





PDFN5×6-8LC

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
GBLHAA02-5DL8	PDFN5×6-8LC	5000 pcs / Tape & Reel	GBLHAA02

Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Parameter	Symbol	N Channel	P Channel	Unit
Drain-to-Source Voltage	V_{DSS}	100	-100	V
Gate-to-Source Voltage	V_{GSS}	±20	±20	V
Continuous Drain Current (T_C = 25°C)	I_D	10	-6	A
Continuous Drain Current (T_C = 100°C)		6.3	-3.8	A
Continuous Drain Current (T_A = 25°C) ^{*1}		2.5	-1.6	A
Continuous Drain Current (T_A = 100°C) ^{*1}		1.6	-1	A
Pulsed Drain Current (t_p = 10µs, T_C = 25°C)	I_{DM}	40	-24	A
Single Pulse Avalanche Energy ^{*3}	E_{AS}	14	14	mJ
Power Dissipation (T_C = 25°C)	P_D	25	25	W
Operating Junction Temperature Range	T_J	-55 ~ +150		°C
Storage Temperature Range	T_{STG}	-55 ~ +150		°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	-	5	°C/W
Thermal Resistance Junction-to-Air [*1]	$R_{\theta JA}$	-	-	70	°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	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 100V, 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 = 5A	-	80	120	mΩ
		V_{GS} = 4.5V,I_D = 3A	-	84	140	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	-	3.5	-	Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz	-	1010	-	pF
C_{OSS}	Output Capacitance		-	36	-	
C_{RSS}	Reverse Transfer Capacitance		-	31	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time [*4]	V_{DD} = 50V I_D = 5A R_G = 5Ω	-	9	-	ns
t_r	Turn-on Rise Time [*4]		-	13	-	
$t_{d(OFF)}$	Turn-Off Delay Time [*4]		-	22	-	
t_f	Turn-Off Fall Time [*4]		-	7.5	-	
Q_G	Total Gate-Charge	V_{DD} = 50V V_{GS} = 10V I_D = 5A	-	24.5	-	nC
Q_{GS}	Gate to Source Charge		-	2.4	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	5.5	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage [*2]	I_{SD} = 5A, V_{GS} = 0V	-	0.84	1.2	V
trr	Reverse Recovery Time	I_S = 5A, V_{GS} = 0V di/dt = 100A/μs	-	34	-	ns
Qrr	Reverse Recovery Charge		-	39	-	nC

Electrical Characteristics-P (@ 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	-100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -100V, 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 = -3A	-	280	310	mΩ
		V_{GS} = -4.5V, I_D = -3A	-	295	340	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1	-1.8	-2.5	V
R_G	Gate Resistance	V_{GS} = 0V, f = 1MHz	-	7	-	Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = -25V f = 1.0MHz	-	1192	-	pF
C_{OSS}	Output Capacitance		-	33	-	
C_{RSS}	Reverse Transfer Capacitance		-	28	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time *4	V_{DD} = -50V I_D = -3A R_G = 5Ω	-	8	-	ns
t_r	Turn-on Rise Time *4		-	16	-	
$t_{d(OFF)}$	Turn-Off Delay Time *4		-	36	-	
t_f	Turn-Off Fall Time *4		-	18	-	
Q_G	Total Gate-Charge	V_{DD} = -50V V_{GS} = -10V I_D = -5A	-	26.5	-	nC
Q_{GS}	Gate to Source Charge		-	3.5	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	4.2	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	I_{SD} = -3A, V_{GS} = 0V	-	-0.9	-1.2	V
trr	Reverse Recovery Time	I_S = -5A, V_{GS} = 0V di/dt = 100A/μs	-	50	-	ns
Qrr	Reverse Recovery Charge		-	93	-	nC

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
3. The E_{AS} data shows Max. rating. The test condition is：N channel： V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH
   P channel： V_{DD} = -50V, V_{GS} = -10V, L = 0.5mH
4. Guaranteed by design, not subject to production

Ratings and Characteristics Curves-N (@ T_A = 25°C unless otherwise specified)

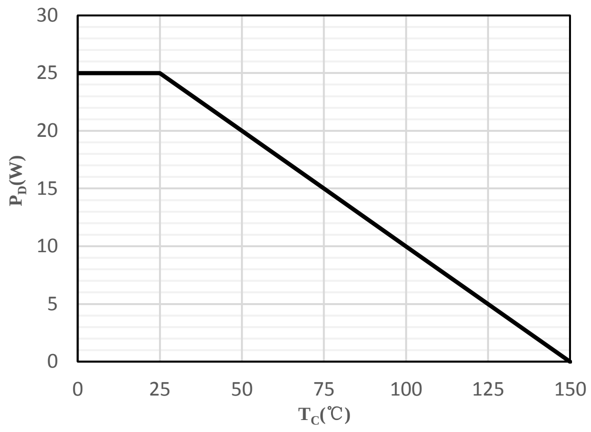


Fig 1　Power Dissipation

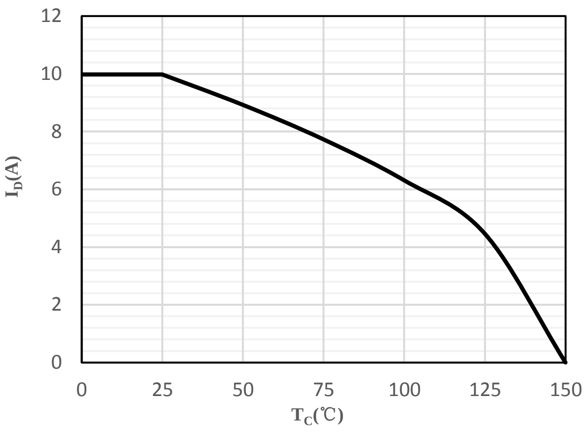


Fig 2　Drain Current

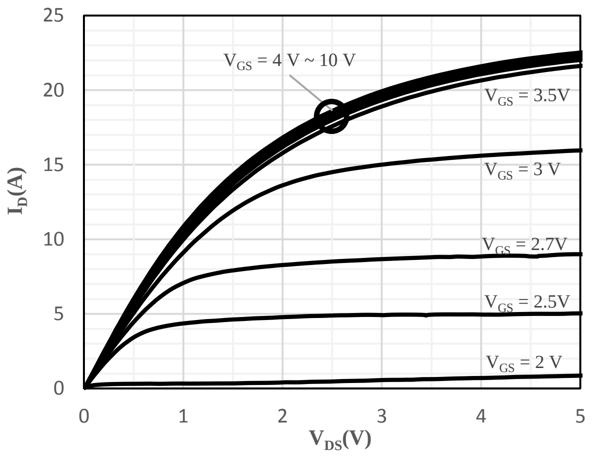


Fig 3　Typical Output Characteristics

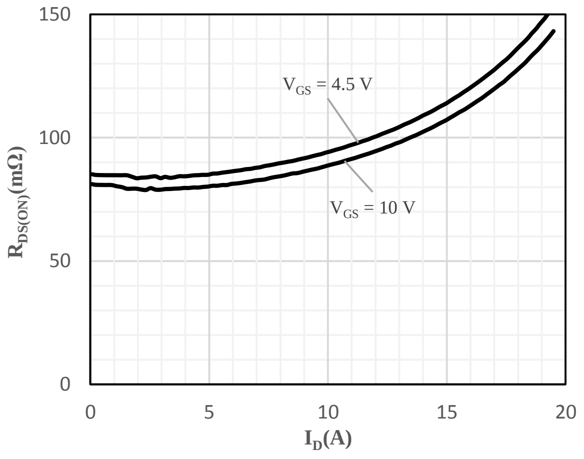


Fig 4　On-Resistance vs. Drain Current and Gate Voltage

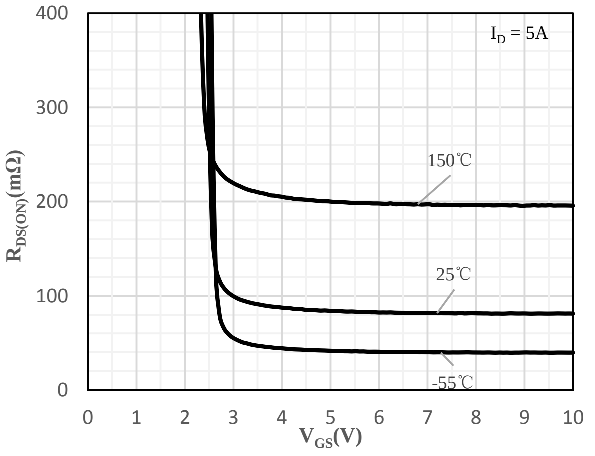


Fig 5　On-Resistance vs. Gate-Source Voltage

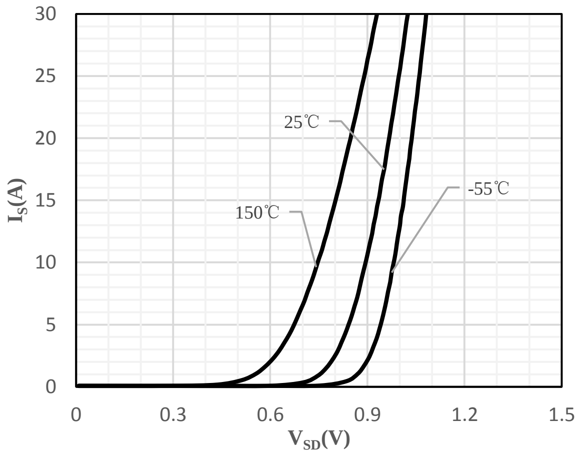
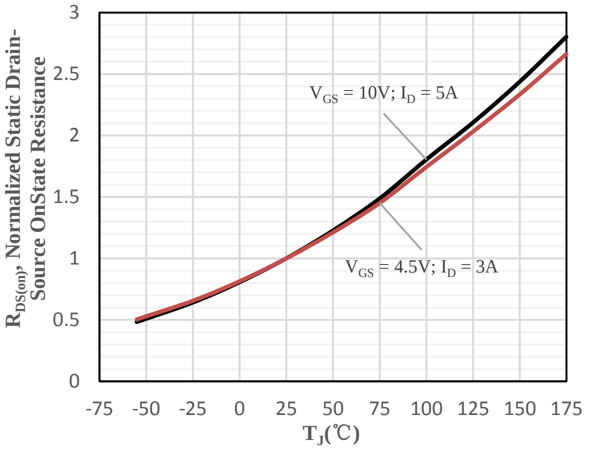


Fig 6　Body-Diode Characteristics



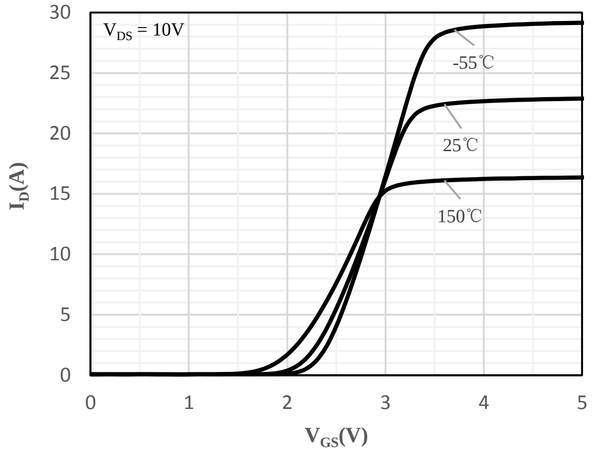
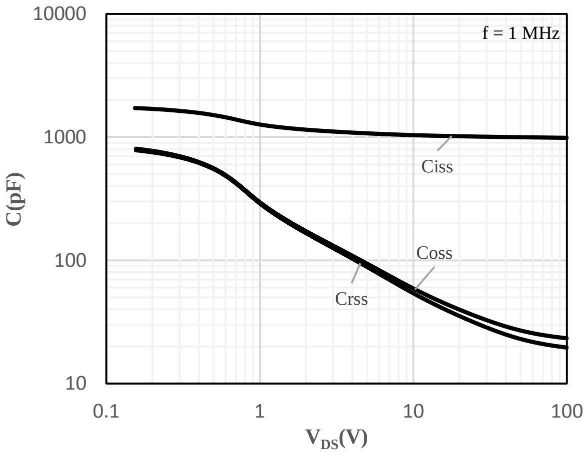


Fig 7 Normalized On-Resistance vs. Junction Temperature

Fig 8 Transfer Characteristics



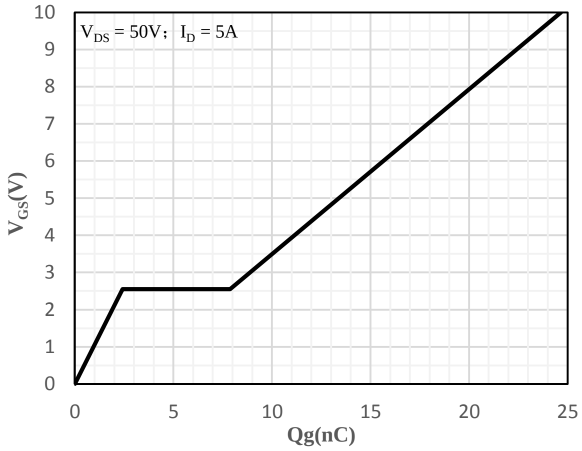
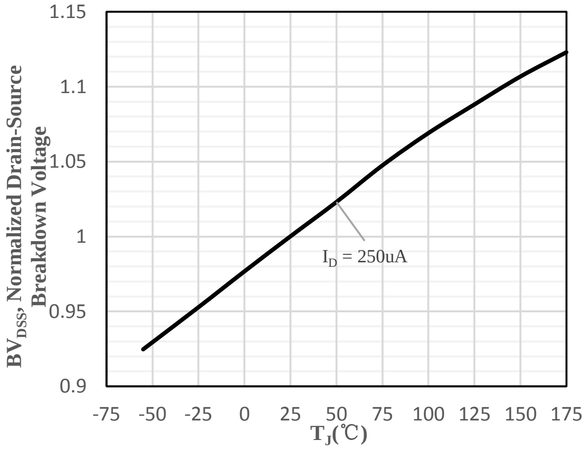


Fig 9 Capacitance Characteristics

Fig 10 Gate-Charge Characteristics



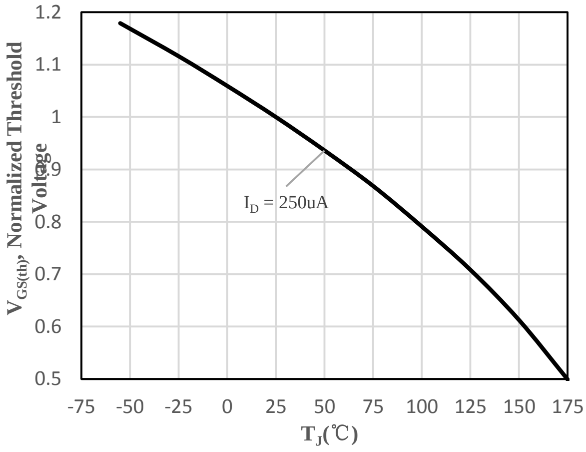


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

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

Ratings and Characteristics Curves-P (@ T_A = 25°C unless otherwise specified)

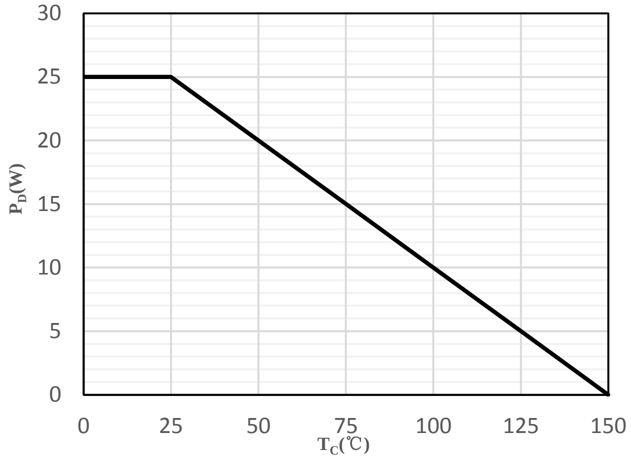


Fig 1 Power Dissipation

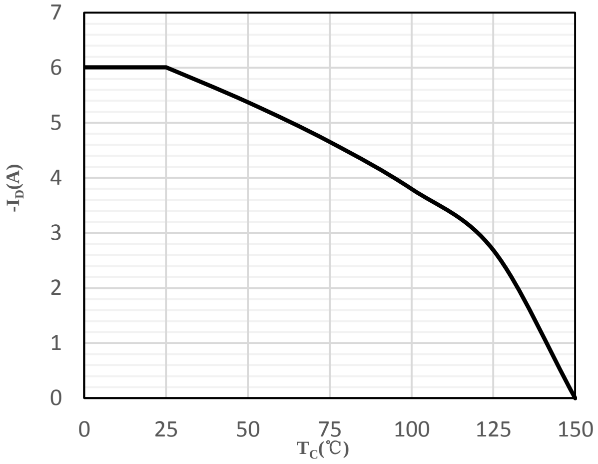


Fig 2 Drain Current

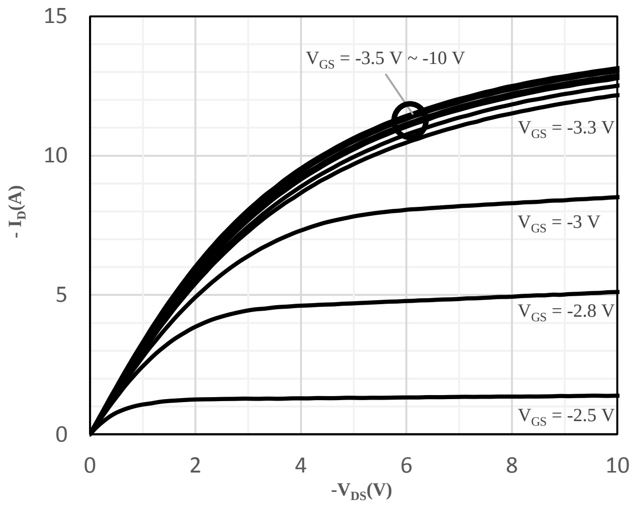


Fig 3 Typical Output Characteristics

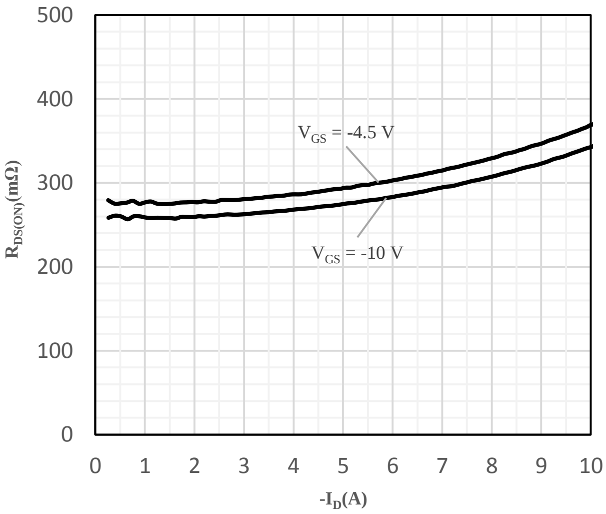


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

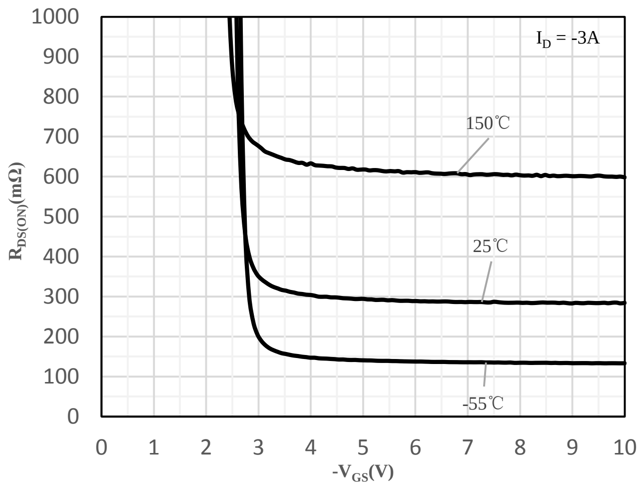


Fig 5 On-Resistance vs. Gate-Source Voltage

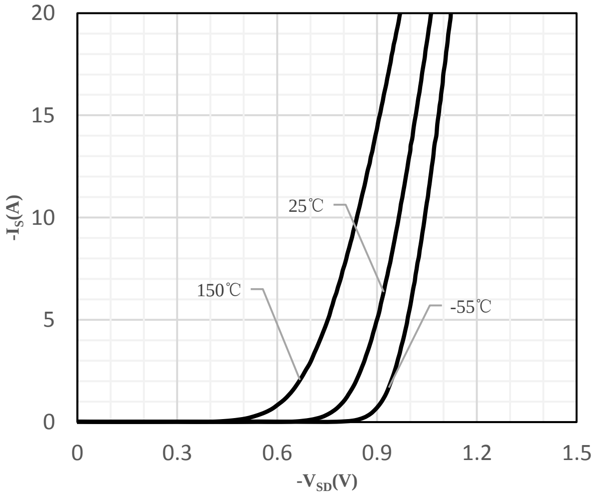
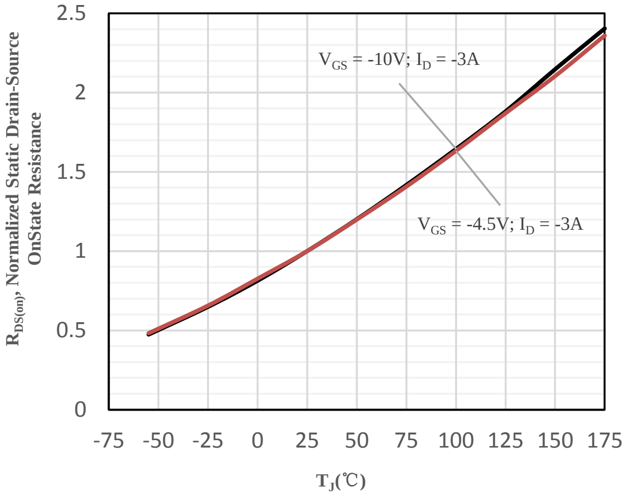


Fig 6 Body-Diode Characteristics



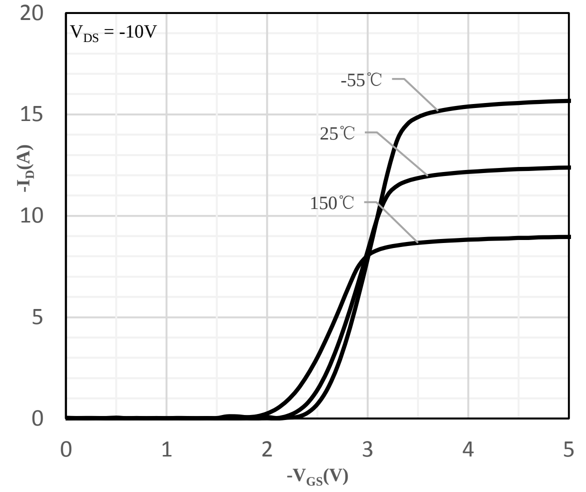
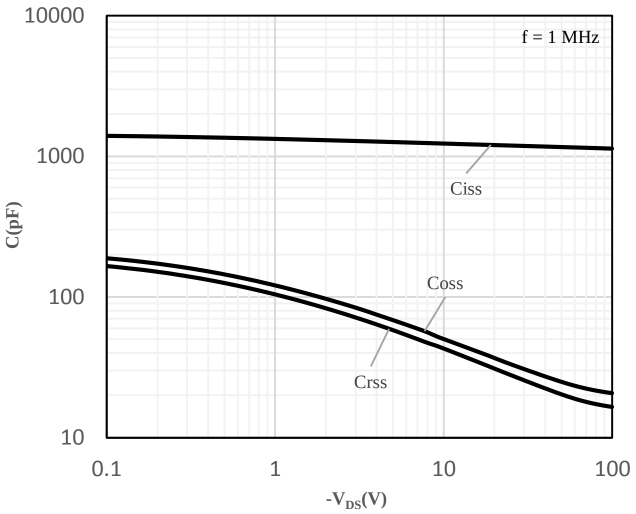


Fig 7 Normalized On-Resistance vs. Junction Temperature

Fig 8 Transfer Characteristics



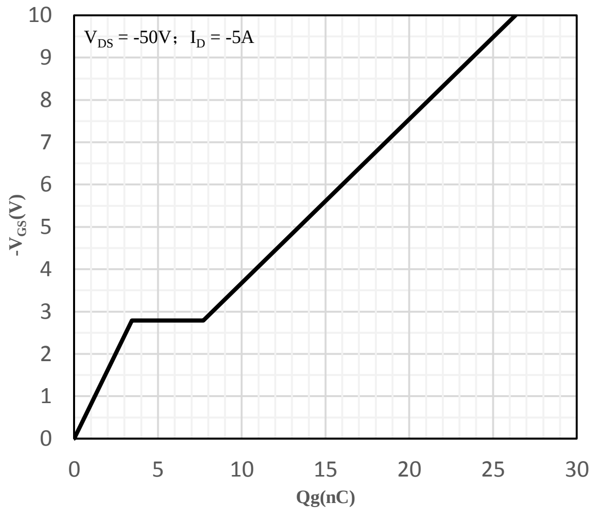
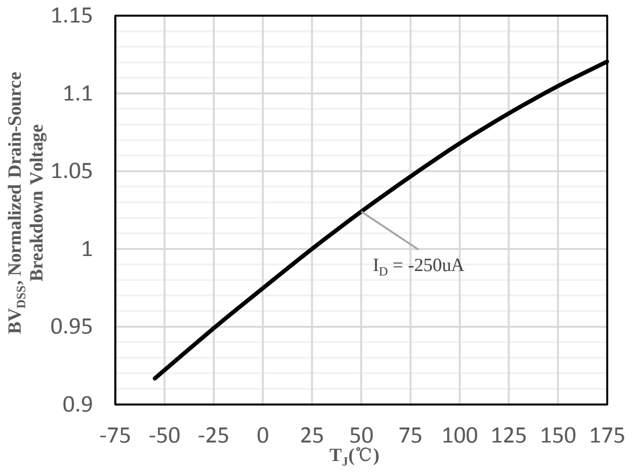


Fig 9 Capacitance Characteristics

Fig 10 Gate-Charge Characteristics



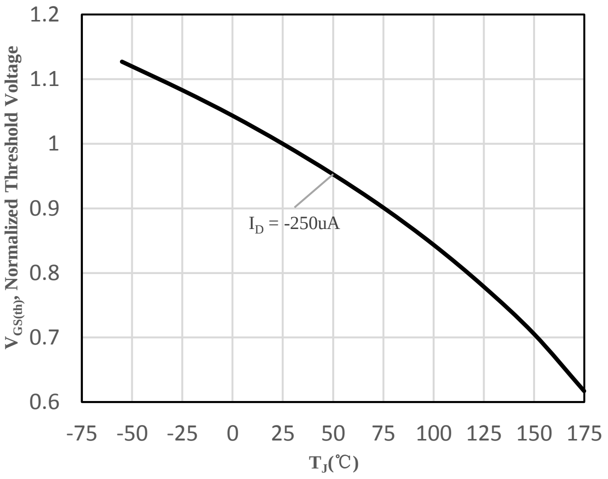
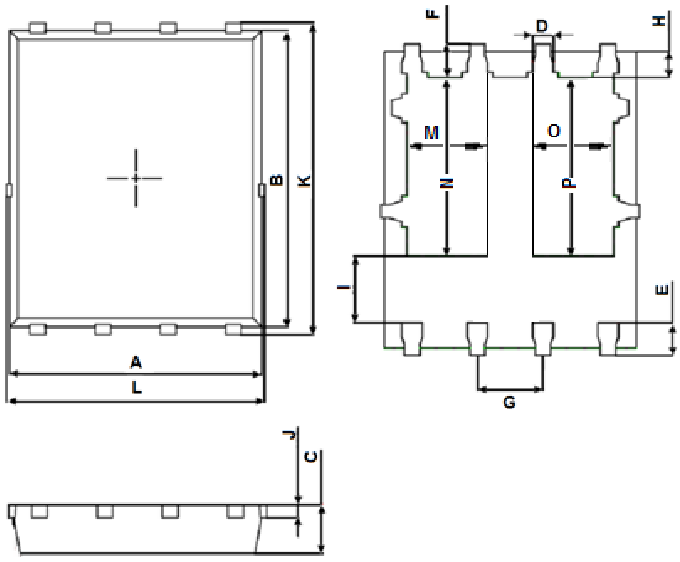


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

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

Package Outline Dimensions (Unit: mm)



PDFN5×6-8LC		
Dimension	**Min.**	**Max.**
A	4.824	4.976
B	5.674	5.826
C	0.900	1.000
D	0.350	0.450
E	0.559	0.711
F	0.574	0.726
G	1.250	1.290
H	0.424	0.576
I	1.190	1.390
J	0.154	0.354
K	5.974	6.126
L	4.944	5.096
M/O	1.595	1.795
N/P	3.375	3.575

Mounting Pad Layout (Unit: mm)

PDFN5×6-8LC