P+N-Channel Enhancement Mode MOSFET

GBLH4401-5DL8

Features

- Reliable and Rugged
- Green device available

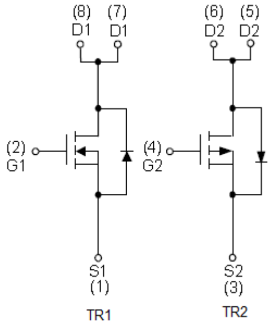
HF

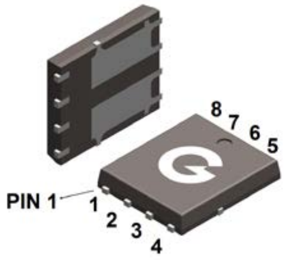
Applications

- Synchronous Rectification
- Motor Control
- Protable 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
GBLH4401-5DL8	PDFN5×6-8LC	5000 pcs / Tape & Reel	GBLH4401

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

Parameter	Symbol	TR1	TR2	Unit
Drain-to-Source Voltage	V_{DSS}	40	-40	V
Gate-to-Source Voltage	V_{GSS}	±20	±20	V
Continuous Drain Current (T_A = 25°C) *1	I_D	6	-5.1	A
Continuous Drain Current (T_A = 100°C) *1		3.9	-3.2	A
Pulsed Drain Current *1, 2	I_{DM}	24	-20	A

Thermal Characteristics

Parameter	Symbol	TR1	TR2	Unit
Power Dissipation (T_A = 25°C)	P_D	2	2	W
Operating Junction Temperature Range	T_J	-55 ~ +150		°C
Storage Temperature Range	T_{STG}	-55 ~ +150		°C

Electrical Characteristics-TR1 (@ 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	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 32V, V_{GS} = 0V, T_J = 25°C	-	-	1	μA
		V_{DS} = 32V, V_{GS} = 0V, T_J = 85°C	-	-	30	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$R_{DS(ON)}$	Static Drain-Source On-resistance *2	V_{GS} = 10V,I_D = 6A	-	-	35	mΩ
		V_{GS} = 4.5V,I_D = 5A	-	-	55	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1	-	2.5	V
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 20V f = 1.0MHz	-	600	-	pF
C_{OSS}	Output Capacitance		-	62	-	
C_{RSS}	Reverse Transfer Capacitance		-	48	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{GS} = 10V, V_{DD} = 20V R_L = 3.3Ω, R_G = 4.5Ω I_D = 6A	-	4.8	-	ns
t_r	Turn-on Rise Time		-	29	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	9	-	
t_f	Turn-Off Fall Time		-	17	-	
Q_G	Total Gate-Charge	V_{DD} = 20V V_{GS} = 10V I_D = 6A	-	12	-	nC
Q_{GS}	Gate to Source Charge		-	2.9	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	1.9	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	I_{SD} = 6A, V_{GS} = 0V	-	-	1.3	V
trr	Reverse Recovery Time	I_{SD} = 6A, dI_{SD}/dt = 100 A/μs	-	7	-	ns
Qrr	Reverse Recovery Charge		-	4	-	nC

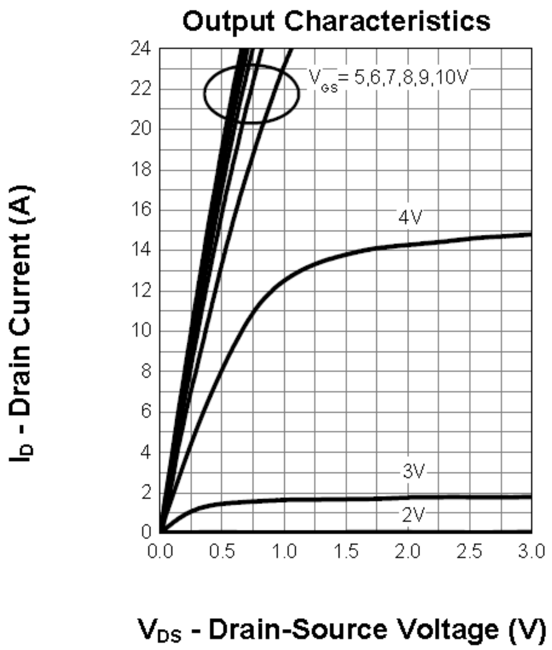
Notes:

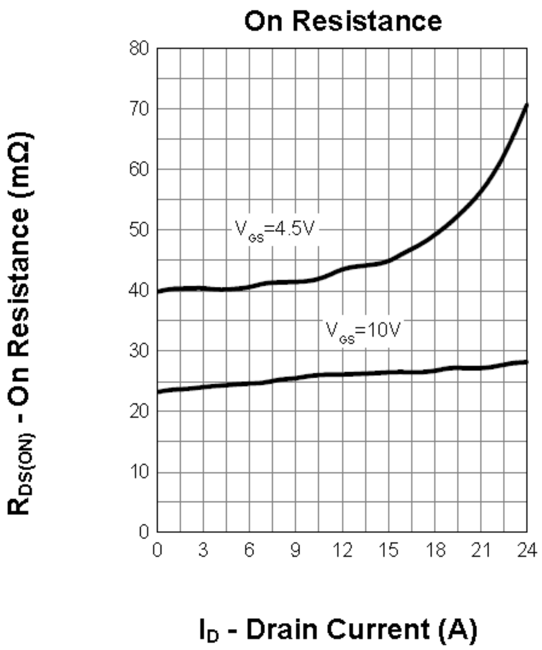
1. Surface mounted on 1 in^2 pad area, t ≤ 10 sec
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%

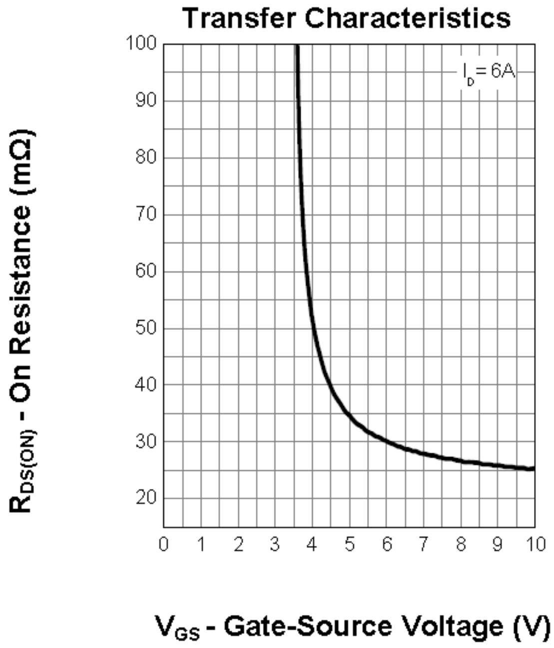
Electrical Characteristics-TR2 (@ T_A = 25°C unless otherwise specified)

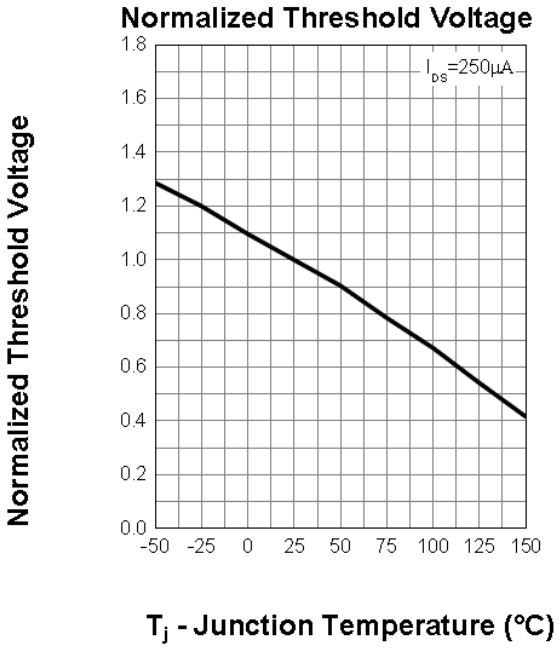
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = -250μA	-40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -32V, V_{GS} = 0V, T_J = 25°C	-	-	-1	μA
		V_{DS} = -32V, V_{GS} = 0V, T_J = 85°C	-	-	-30	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$R_{DS(ON)}$	Static Drain-Source On-resistance *2	V_{GS} = -10V, I_D = -4A	-	-	50	mΩ
		V_{GS} = -4.5V, I_D = -3A	-	-	75	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1	-	-2.5	V
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = -20V f = 1.0MHz	-	1100	-	pF
C_{OSS}	Output Capacitance		-	100	-	
C_{RSS}	Reverse Transfer Capacitance		-	80	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{GS} = -10V, V_{DD} = -20V R_G = 4.5Ω, R_L = 5Ω I_D = -4A	-	11.8	-	ns
t_r	Turn-on Rise Time		-	32	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	125	-	
t_f	Turn-Off Fall Time		-	53	-	
Q_G	Total Gate-Charge	V_{GS} = -10V V_{DD} = -20V I_D = -4A	-	19.5	-	nC
Q_{GS}	Gate to Source Charge		-	4.6	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	2.7	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_{SD} = -4A, V_{GS} = 0V	-	-	-1.3	V
trr	Reverse Recovery Time	I_{SD} = - 4 A, dI_{SD}/dt = 100 A/μs	-	13	-	ns
Qrr	Reverse Recovery Charge		-	9.8	-	nC

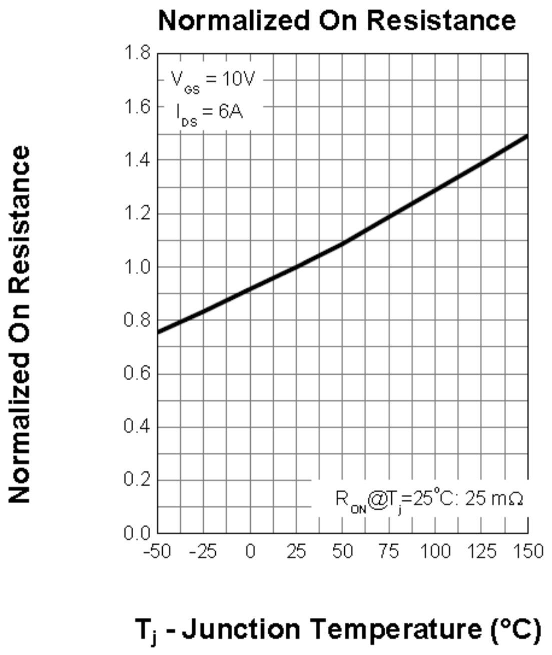
Ratings and Characteristics Curves-TR1 (@ T_A = 25°C unless otherwise specified)

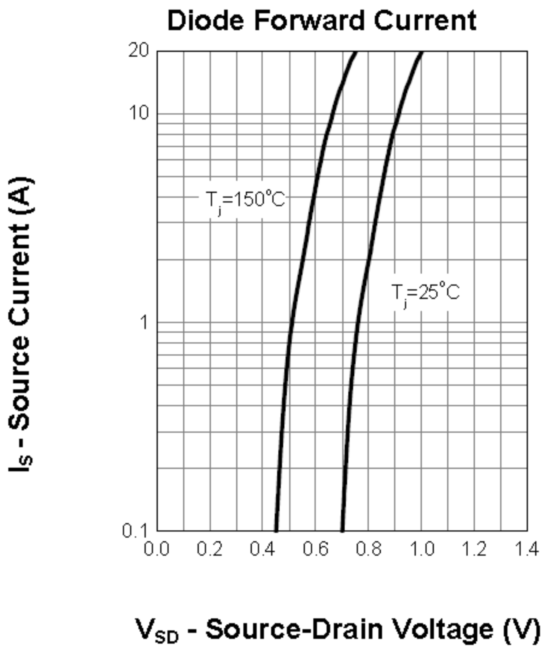


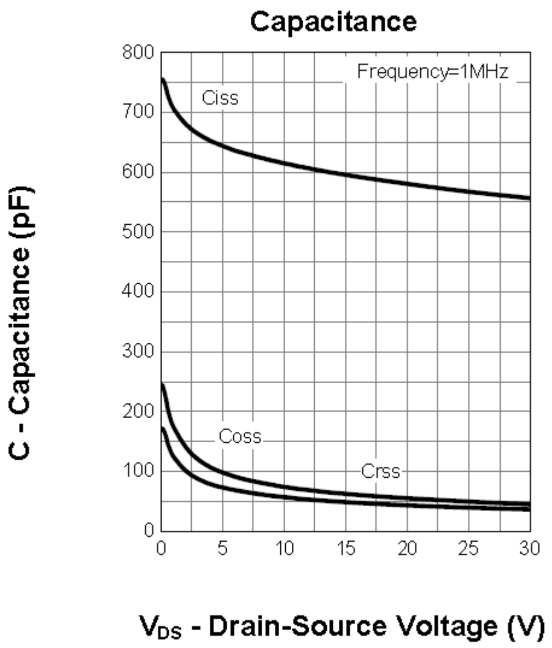


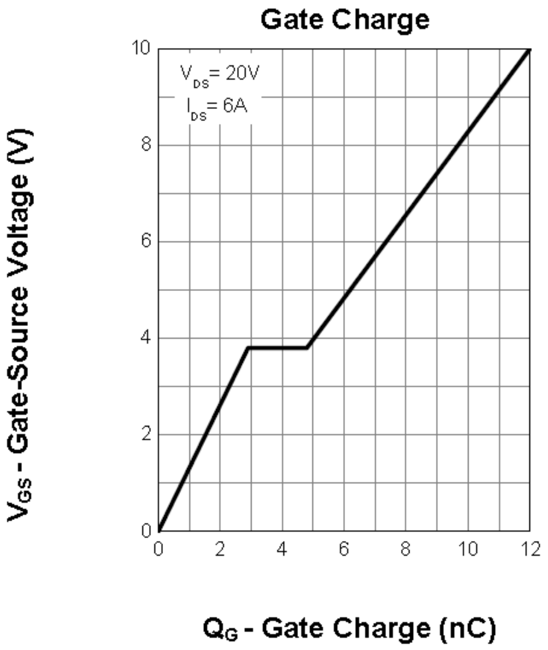




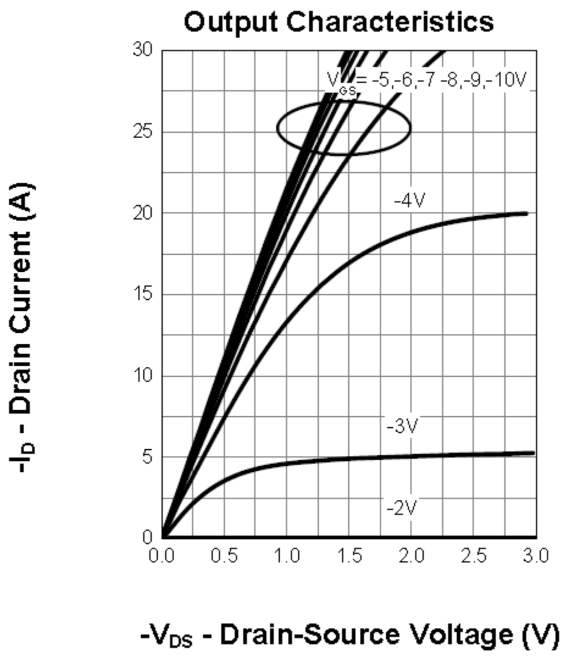

Normalized On Resistance
Normalized On Resistance
V_{GS} = 10V
I_{DS} = 6A
R_{ON}@T_j=25°C: 25 mΩ
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-50
-25
0
25
50
75
100
125
150
T_j - Junction Temperature (°C)

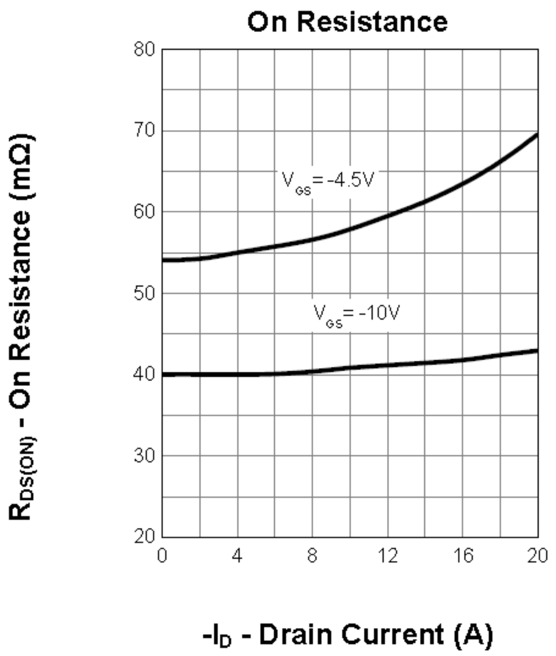

Diode Forward Current
I_S - Source Current (A)
T_j=150°C
T_j=25°C
20
10
1
0.1
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
V_{SD} - Source-Drain Voltage (V)

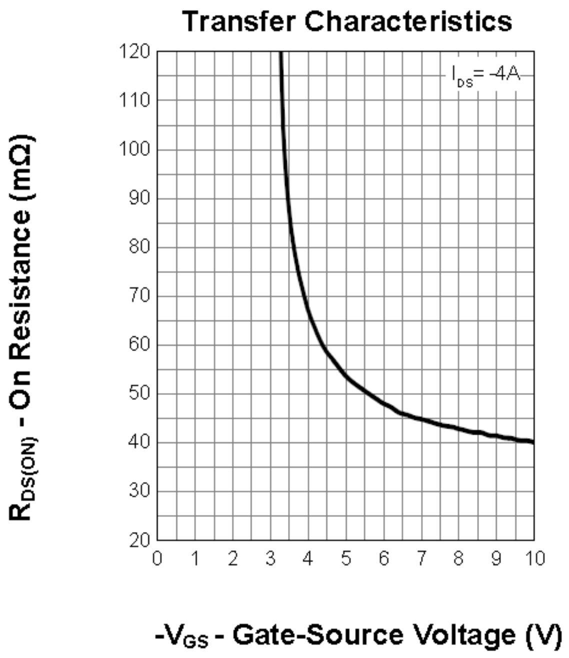

Capacitance
C - Capacitance (pF)
Frequency=1MHz
Ciss
Coss
Crss
800
700
600
500
400
300
200
100
0
0
5
10
15
20
25
30
V_{DS} - Drain-Source Voltage (V)

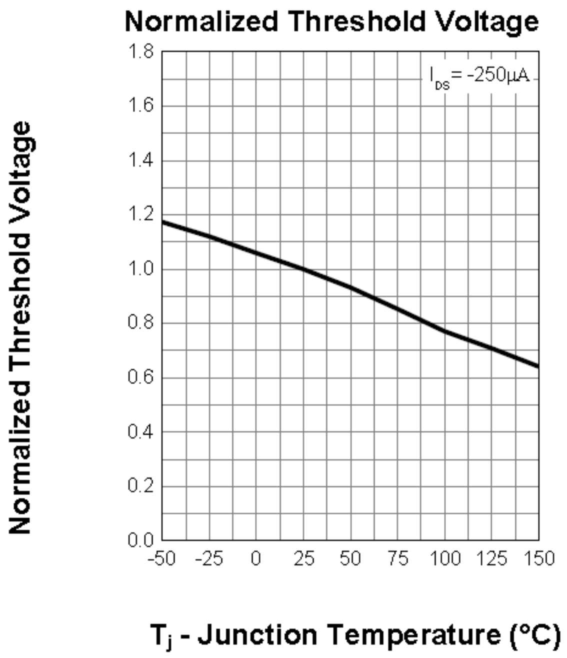

Gate Charge
V_{GS} - Gate-Source Voltage (V)
V_{DS}= 20V
I_{DS}= 6A
10
8
6
4
2
0
0
2
4
6
8
10
12
Q_G - Gate Charge (nC)

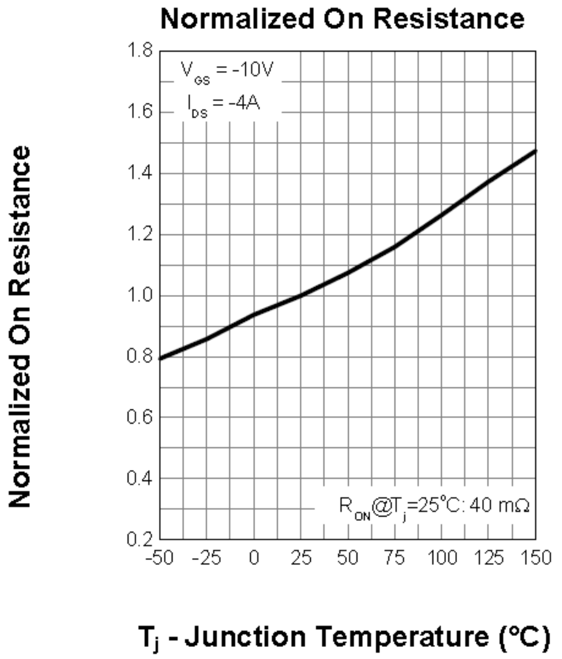
Ratings and Characteristics Curves-TR2 (@ T_A = 25°C unless otherwise specified)

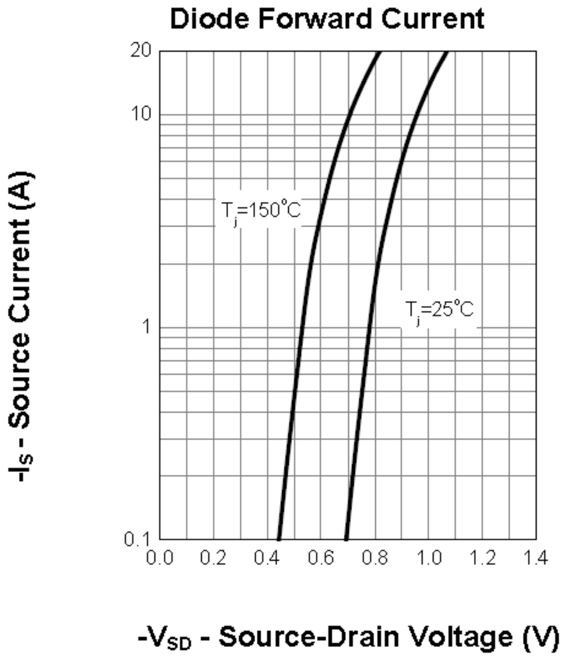


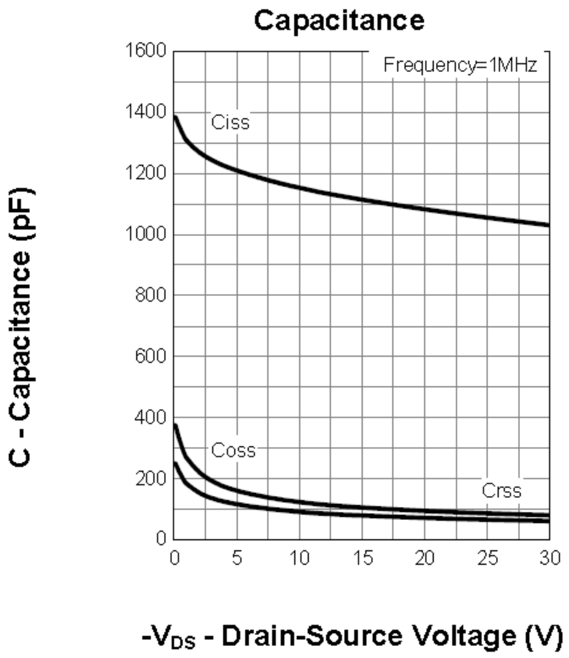


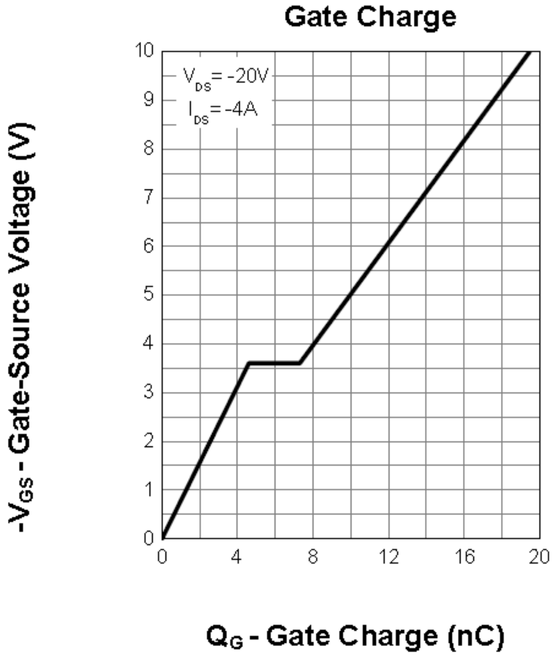




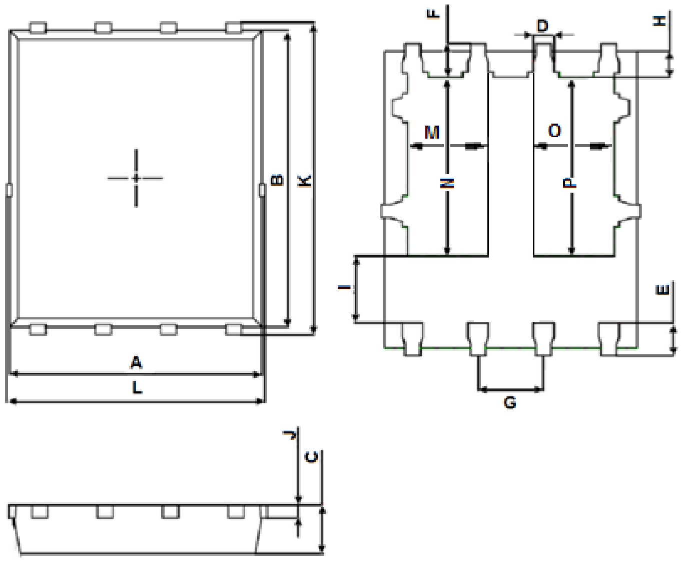

Normalized On Resistance
Normalized On Resistance
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
V_{GS} = -10V
I_{DS} = -4A
R_{ON}@T_j=25℃: 40 mΩ
-50 -25 0 25 50 75 100 125 150
T_j - Junction Temperature (℃)


Diode Forward Current
-I_S - Source Current (A)
20
10
1
0.1
T_j=150℃
T_j=25℃
0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4
-V_{SD} - Source-Drain Voltage (V)


Capacitance
C - Capacitance (pF)
1600
1400
1200
1000
800
600
400
200
0
Frequency=1MHz
Ciss
Coss
Crss
0 5 10 15 20 25 30
-V_{DS} - Drain-Source Voltage (V)


Gate Charge
-V_{GS} - Gate-Source Voltage (V)
10
9
8
7
6
5
4
3
2
1
0
V_{DS}= -20V
I_{DS}= -4A
0 4 8 12 16 20
Q_G - Gate Charge (nC)

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

Important Notice

Changzhou Galaxy Century Microelectronics (GME) reserves the right to make changes without further notice to any product information (copyrighted) herein to make corrections, modifications, improvements, or other changes. GME does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others.