

Complementary Enhancement Mode Field Effect Transistor

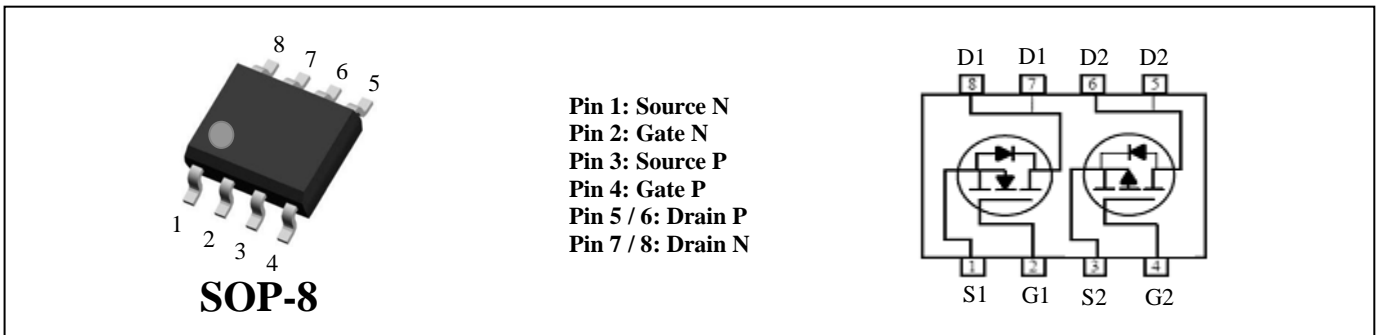
PRODUCT SUMMARY (N-Channel)		
V _{DSS}	I _D	R _{DS(on)} (mΩ) Max
40V	6A	31 @ V _{GS} = 10 V, I _D =6A
		45 @ V _{GS} = 4.5V, I _D =5A

PRODUCT SUMMARY (P-Channel)		
V _{DSS}	I _D	R _{DS(on)} (mΩ) Max
-40V	-5A	45 @ V _{GS} = -10V, I _D =-5A
		63 @ V _{GS} = -4.5V, I _D =-4A

Features

- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Surface mount Package
- Ordering information : GS4614(Lead(Pb)-free and halogen-free)

RoHS+HF



Absolute Maximum Ratings (T_A=25°C, unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units
V _{DS}	Drain-Source Voltage	40	-40	V
V _{GS}	Gate-Source Voltage	±20	±20	V
I _D	Drain Current ^a T _A =25°C	6	-5	A
I _{DM}	Drain Current ^b (Pulsed)	20	-20	A
P _D	Total Power Dissipation ^a @T _A =25°C	2.0	2.0	W
I _{AS}	Avalanche Current, Single pulse @L=0.3mH ^c	9	12	A
E _{AS}	Avalanche Energy, Single pulse @L=0.3mH ^c	12.2	21.6	mJ
I _S	Maximum Body-Diode Continuous Current	2.5	-2.5	A
T _j , T _{stg}	Operating Junction and Storage Temperature Range ^a	-55 to +150	-55 to +150	°C
R _{θJA}	Maximum Junction-to-Ambient ^a (t≤10S)	62.5	62.5	°C/W

Note: a: Surface Mounted on FR4 Board, t ≤ 5sec.

b: Pulse width limited by maximum junction temperature.

c: UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_j=25°C).

N-Channel Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =10mA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
• On Characteristics^d						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1	-	3	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D = 6A	-	23	31	mΩ
		V _{GS} =4.5V, I _D = 5A	-	33	45	
I _{DS(on)}	On state drain current	V _{GS} =10V, V _{DS} =5V	20	-	-	A
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D = 6A	-	22	-	S
• Dynamic Characteristics^e						
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	-	404	-	pF
C _{oss}	Output Capacitance		-	95	-	
C _{rss}	Reverse Transfer Capacitance		-	37	-	
R _g	Gate resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	-	2.7	-	Ω
• Switching Characteristics^e						
Q _{g(10V)}	Total Gate Charge	V _{DS} =20V, I _D =6A, V _{GS} =10V	-	8.3	-	nC
Q _{g(4.5V)}	Total Gate Charge		-	4.2	-	
Q _{gs}	Gate-Source Charge		-	1.3	-	
Q _{gd}	Gate-Drain Charge		-	2.3	-	
t _{d(on)}	Turn-on Delay Time	V _{GS} = 10V, V _{DS} = 20V, R _L =3.3Ω, R _{GEN} =3Ω	-	4.2	-	nS
t _r	Turn-on Rise Time		-	3.3	-	
t _{d(off)}	Turn-off Delay Time		-	15.6	-	
t _f	Turn-off Fall Time		-	3	-	
t _{rr}	Body Diode Reverse Recovery Time	I _F =6A, dI/dt=100A/μS	-	20.5	-	nS
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =6A, dI/dt=100A/μS	-	14.5	-	nC
• Drain-Source Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =1A	-	-	1	V

Note: d: Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%

e: Guaranteed by design, not subject to production testing.

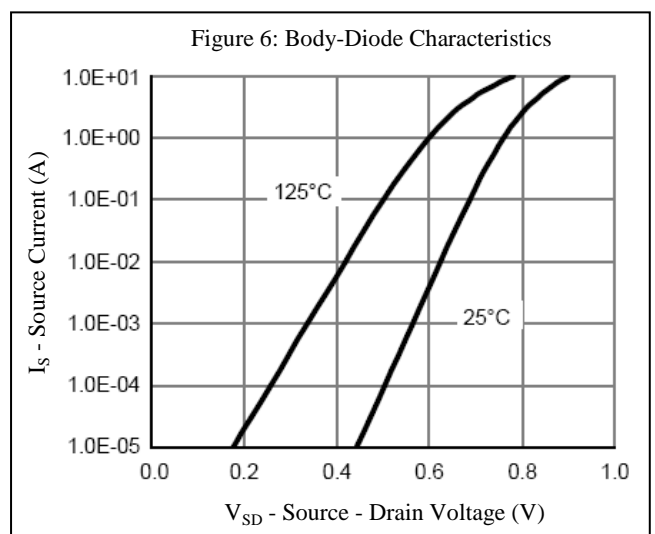
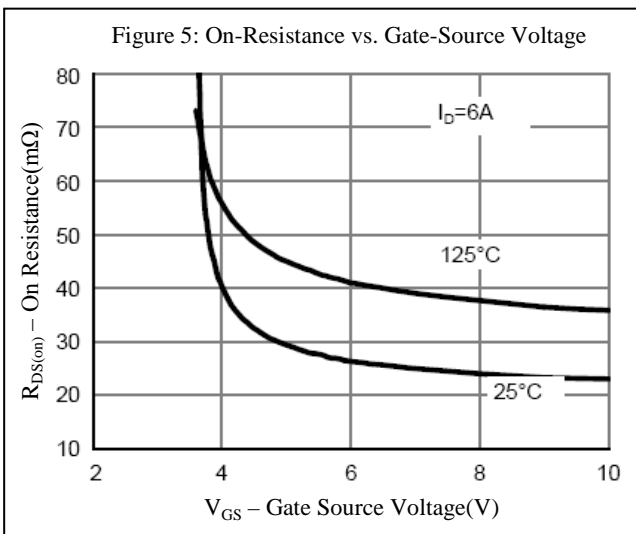
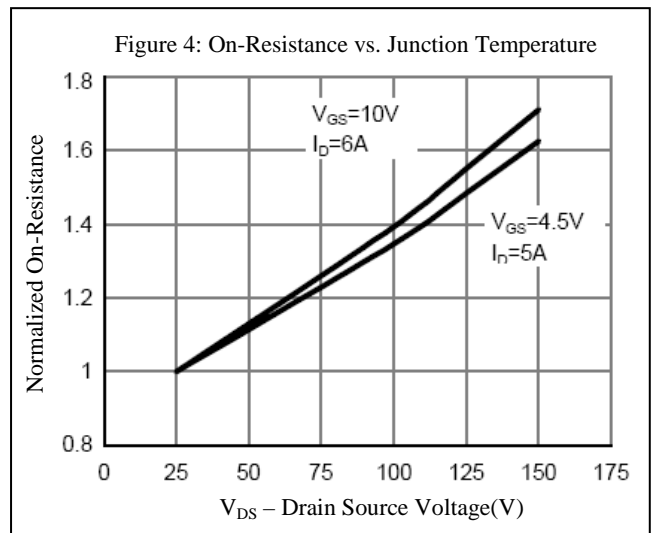
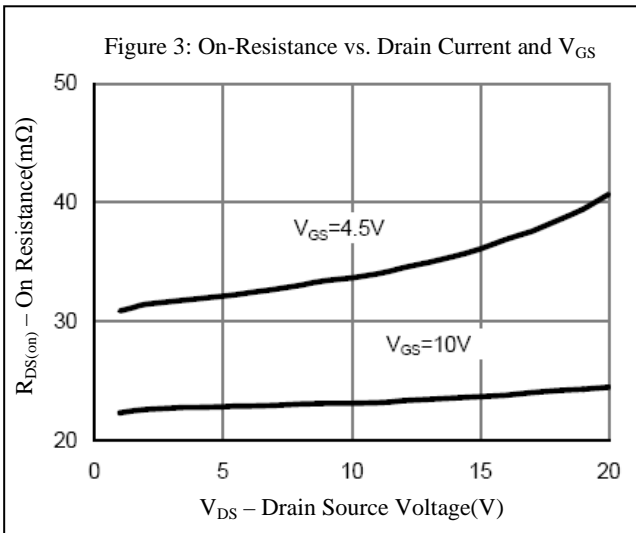
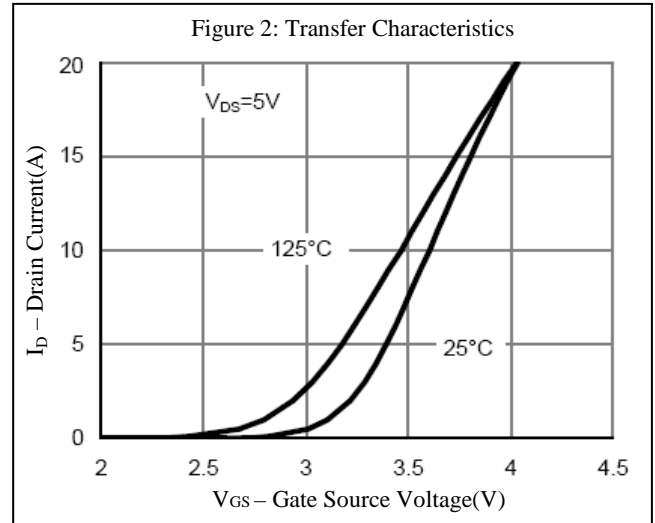
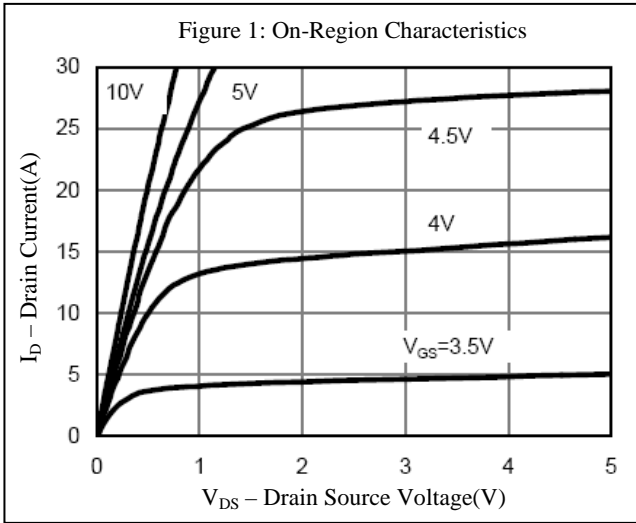
P-Channel Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-10mA	-40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-32V, V _{GS} =0V	-	-	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
• On Characteristics^d						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1	-	-3	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D = -5A	-	32.5	45	mΩ
		V _{GS} =-4.5V, I _D = -4A	-	51.5	63	
I _{DS(on)}	On state drain current	V _{GS} =-10V, V _{DS} =-5V	-20	-	-	A
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D = -4.8A	-	12	-	S
• Dynamic Characteristics^e						
C _{iss}	Input Capacitance	V _{DS} =-20V, V _{GS} =0V, f=1MHz	-	657	-	pF
C _{oss}	Output Capacitance		-	143	-	
C _{rss}	Reverse Transfer Capacitance		-	63	-	
R _g	Gate resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	-	6.5	-	Ω
• Switching Characteristics^e						
Q _{g(10V)}	Total Gate Charge	V _{DS} =-20V, I _D =-5A, V _{GS} =-10V	-	13.6	-	nC
Q _{g(4.5V)}	Total Gate Charge		-	6.8	-	
Q _{gs}	Gate-Source Charge		-	1.8	-	
Q _{gd}	Gate-Drain Charge		-	3.9	-	
t _{d(on)}	Turn-on Delay Time	V _{GS} = -10V, V _{DS} = -20V, R _L =4Ω, R _{GEN} =3	-	7.5	-	nS
t _r	Turn-on Rise Time		-	6.7	-	
t _{d(off)}	Turn-off Delay Time		-	26	-	
t _f	Turn-off Fall Time		-	11.2	-	
t _{rr}	Body Diode Reverse Recovery Time	I _F =-5A, dI/dt=100A/μS	-	22.3	-	nS
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-5A, dI/dt=100A/μS	-	15.2	-	nC
• Drain-Source Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =-1A	-	-	-1	V

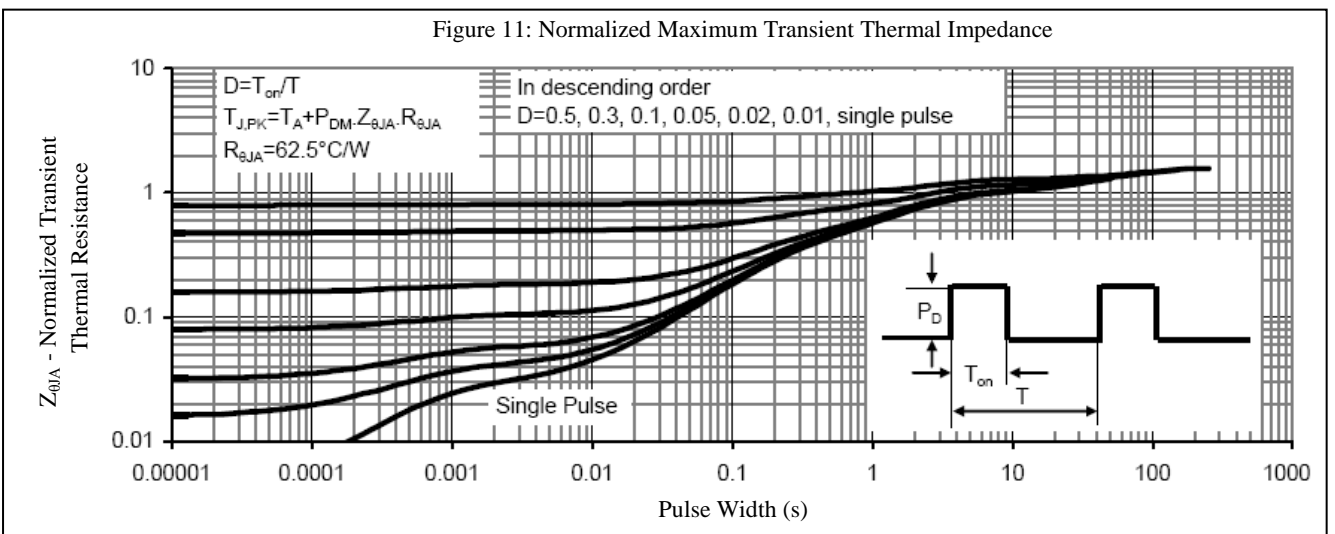
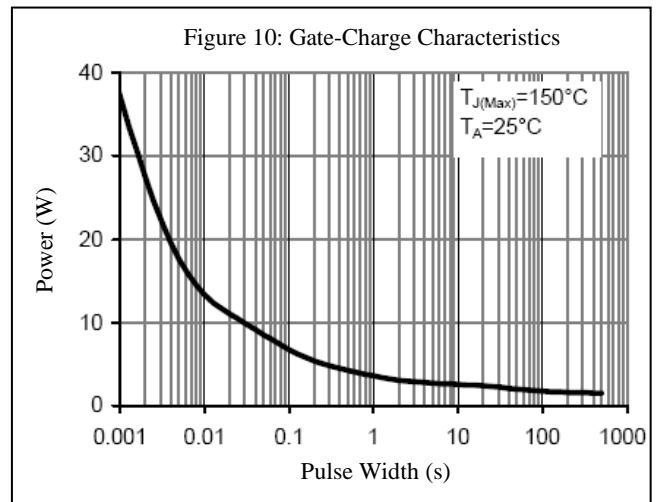
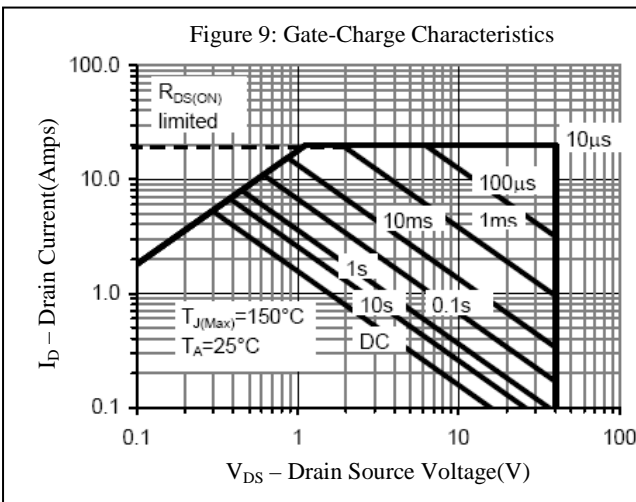
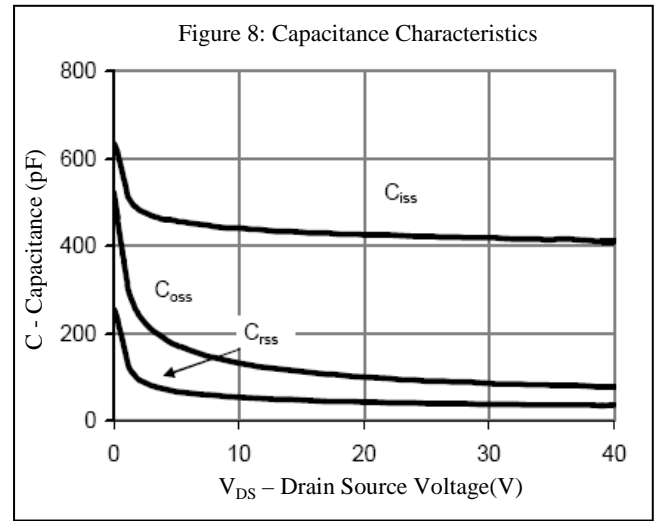
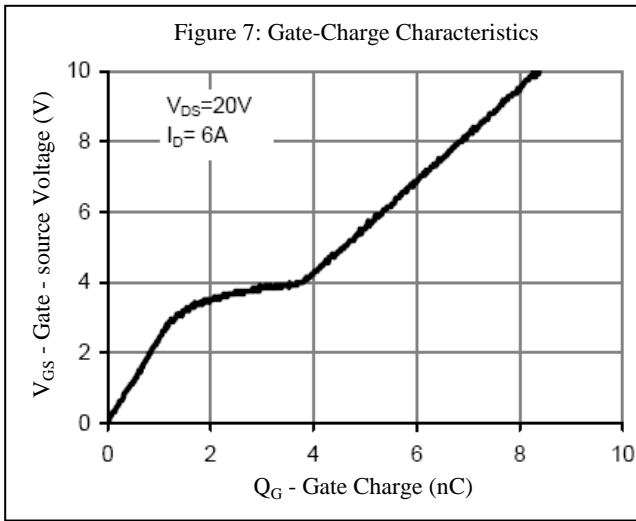
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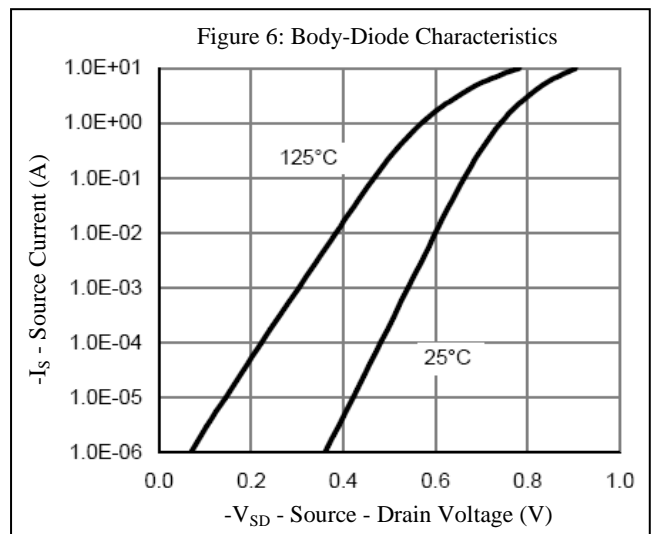
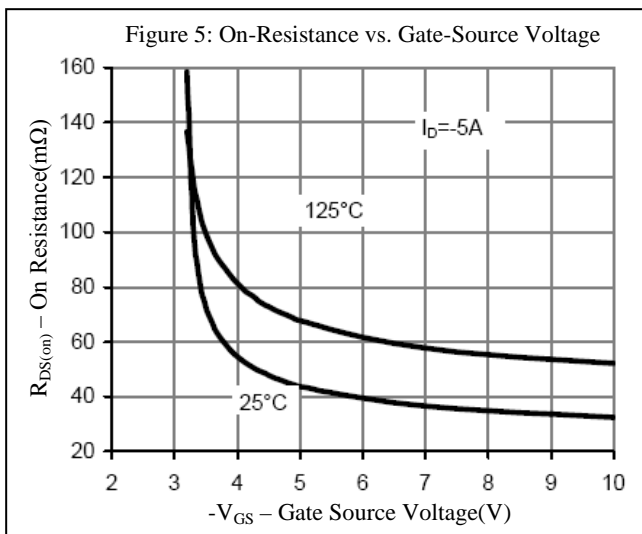
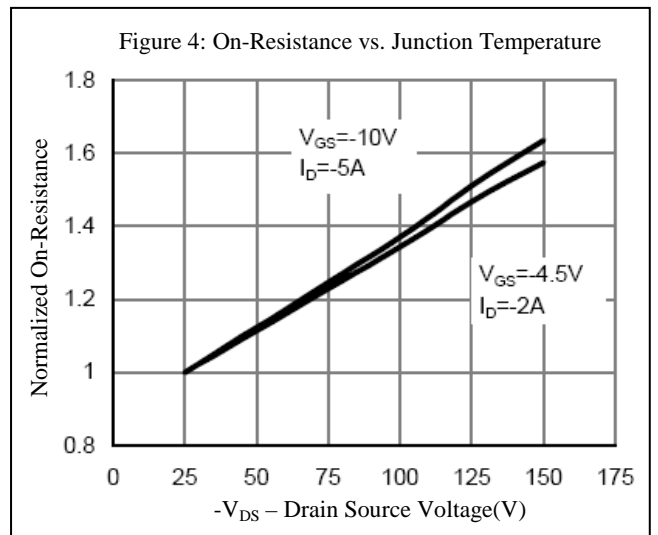
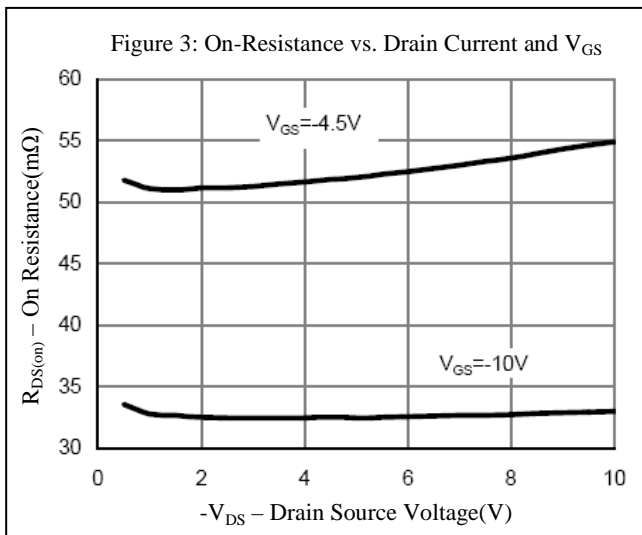
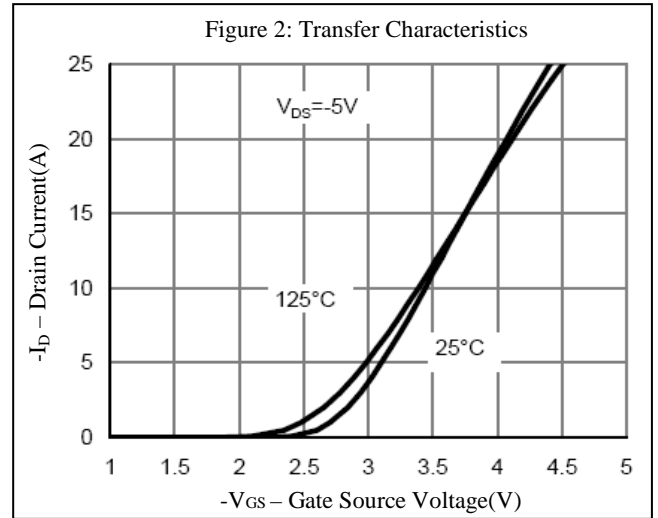
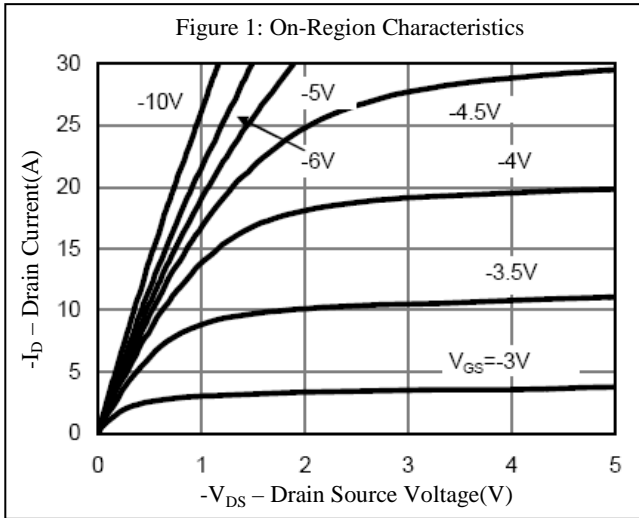
Characteristics Curve(N-Channel)



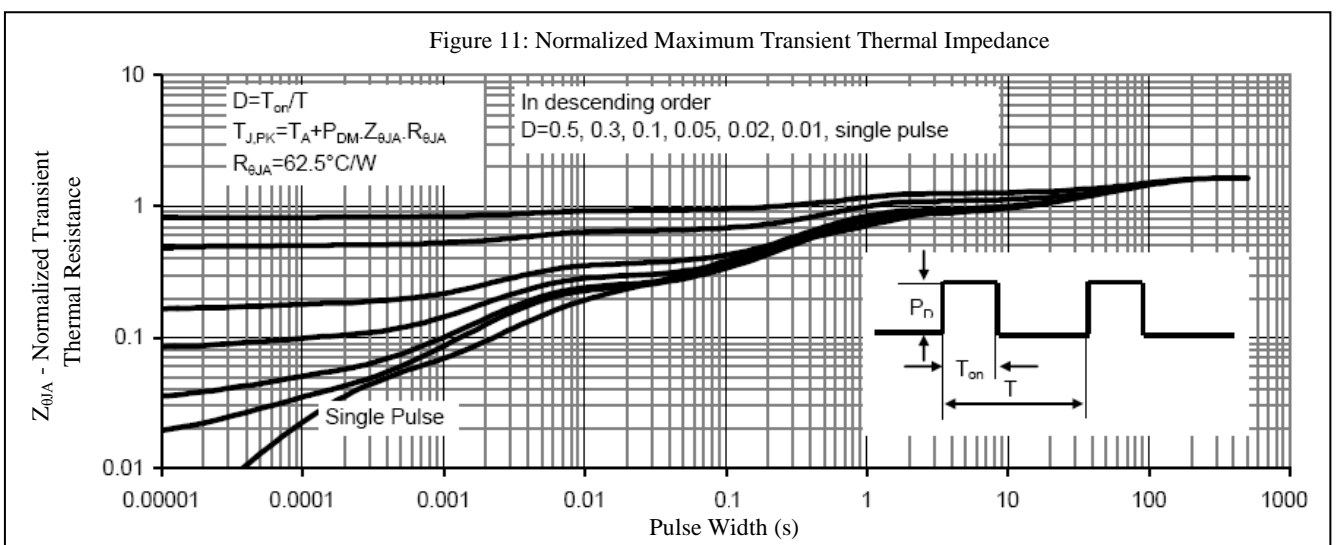
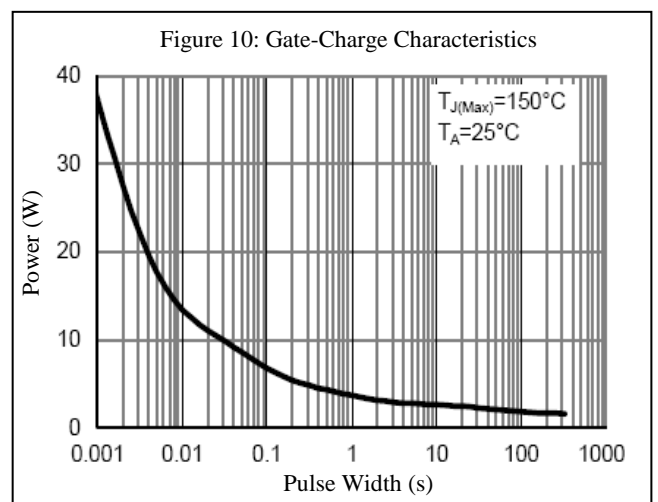
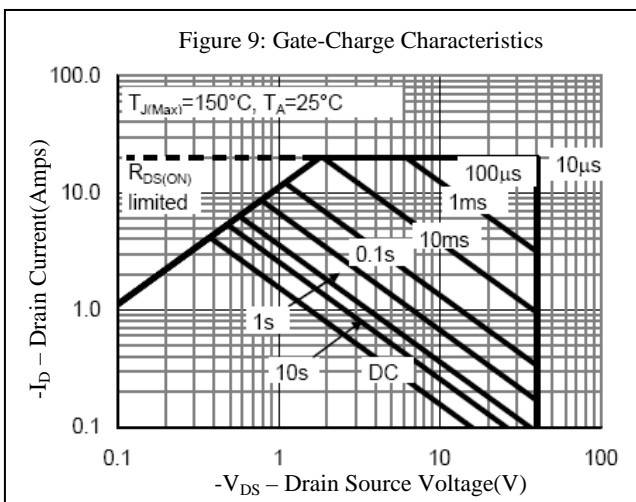
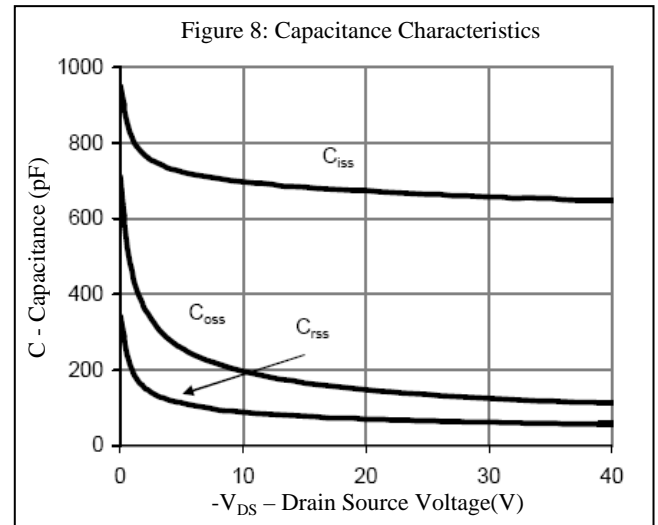
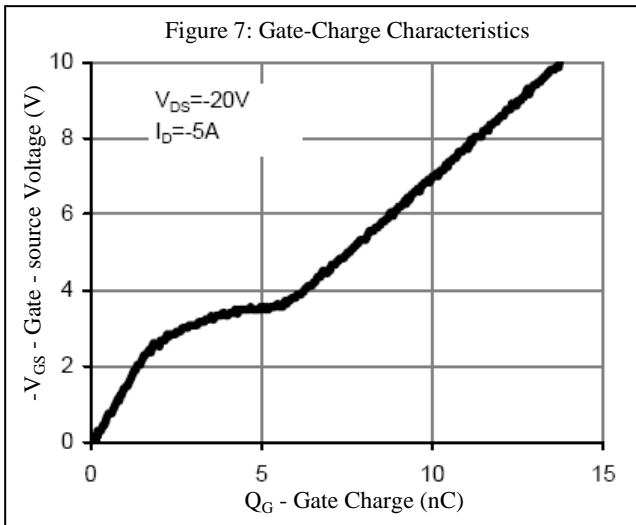
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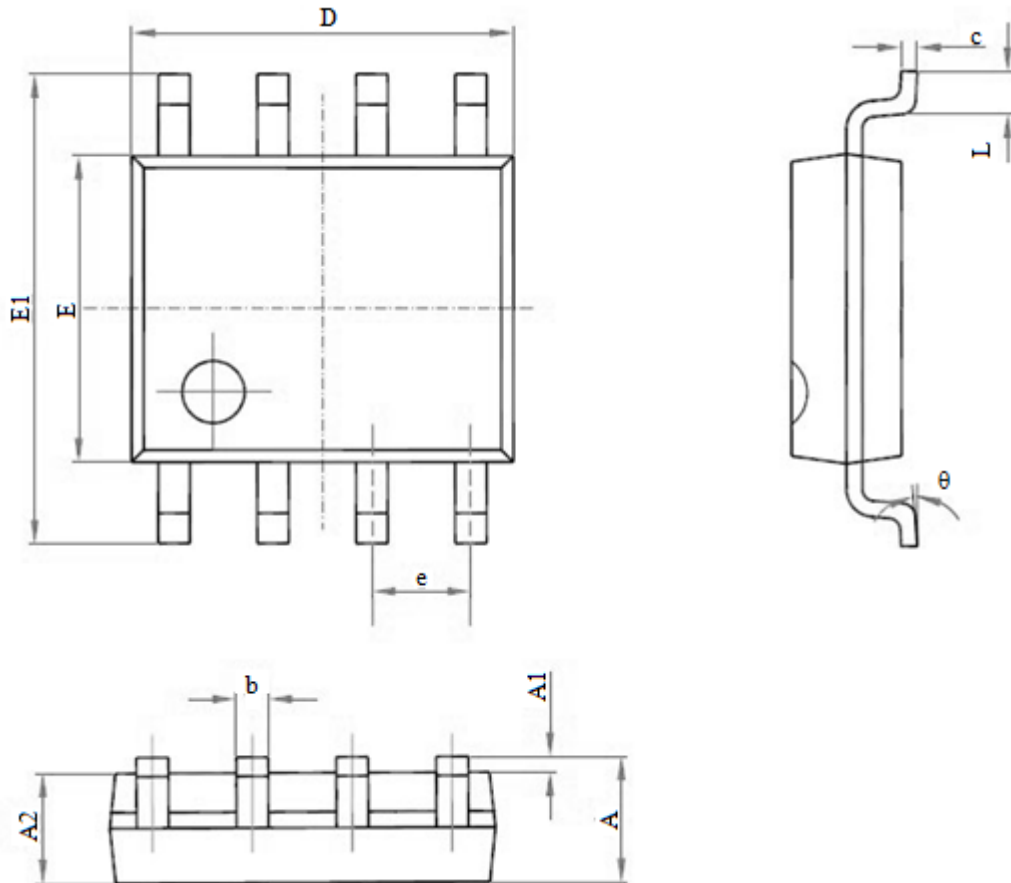
Characteristics Curve(P-Channel)



Characteristics Curve(P-Channel)



P-8 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters (MM)		Dimensions In Inches (MIL)	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.310	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
theta	0°	8°	0°	8°



Notice

1. Specification of the products displayed herein is subject to change without notice. Continuous development may necessitate changes in technical data without notice. GEMMICRO or anyone on its behalf assumes no responsibility or liability for any errors or inaccuracies.

2. Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.