

P-Channel Enhancement-Mode MOSFET (-20V, -4A)


PRODUCT SUMMARY

V _{DSS}	I _D	R _{DS(on)} (mΩ) TYP
-20V	-4A	36 @ V _{GS} = -4.5V, I _D = -4A
		48 @ V _{GS} = -2.5V, I _D = -4A

Features

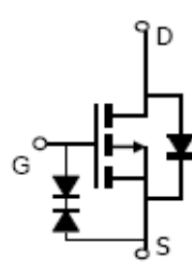
- Super high dense cell trench design for low R_{DS(on)}.
- Rugged and reliable.
- ESD Rating: 2000V HBM
- Ordering information: GV3415E-G (Lead(Pb)-free and halogen-free)

RoHS+HF



GV3415E Pin Assignment & Symbol

3-Lead Plastic SOT-23-3L
Pin 1: Gate 2: Source 3: Drain



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

Symbol	Parameter	Ratings	Units
V _{DS}	Drain-Source Voltage	-20	V
V _{GS}	Gate-Source Voltage	±8	V
I _D	Drain Current @ T _A =25°C	-4	A
I _{DM}	Drain Current (Pulsed) ^a	-30	A
P _D	Total Power Dissipation @ T _A =25°C	1.4	W
T _J , T _{stg}	Operating Junction and Storage Temperature Range	-55 to +150	°C
R _{θJA}	Thermal Resistance Junction to Ambient (t≤10s) ^b	90	°C/W
	Thermal Resistance Junction to Ambient (Steady-State) ^b	125	
R _{θJL}	Thermal Resistance Junction to Lead (Steady-State)	60	°C/W

Note: a: Pulse width limited by the maximum junction temperature

b: 1-in² 2oz Cu PCB board

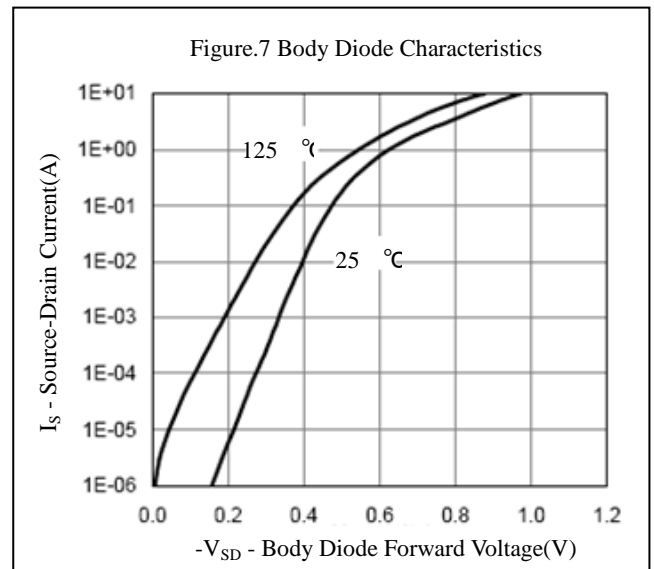
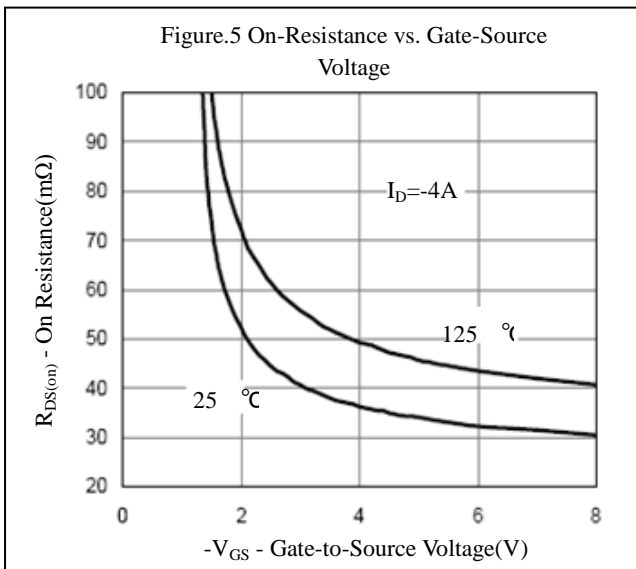
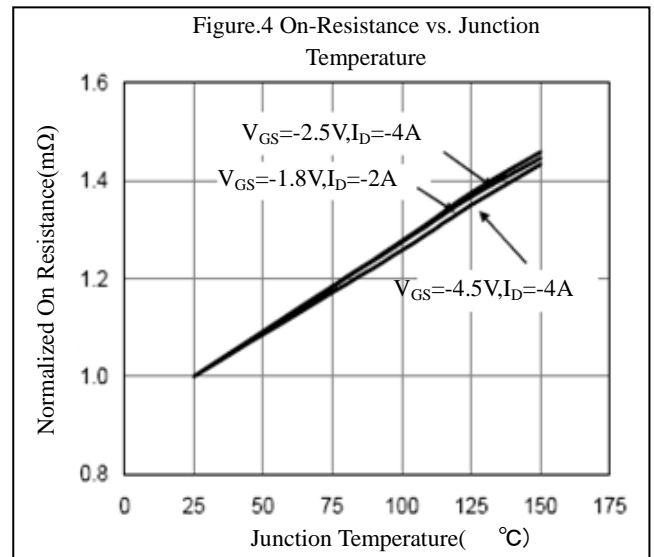
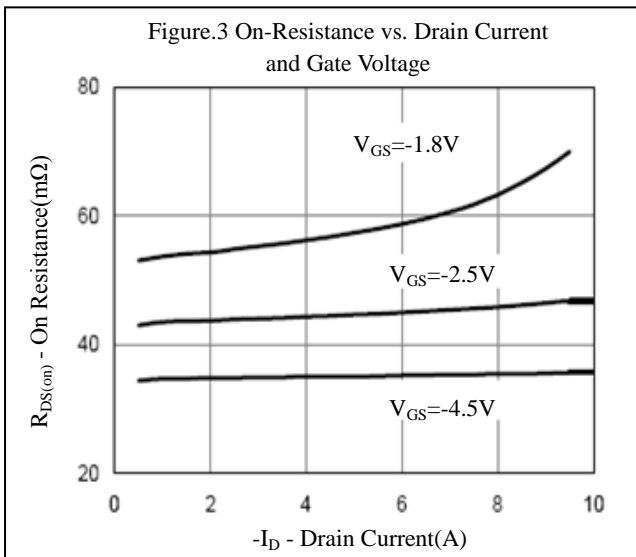
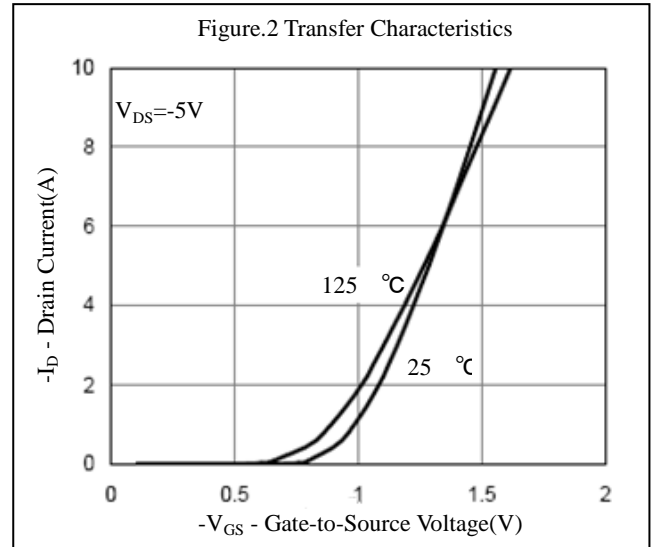
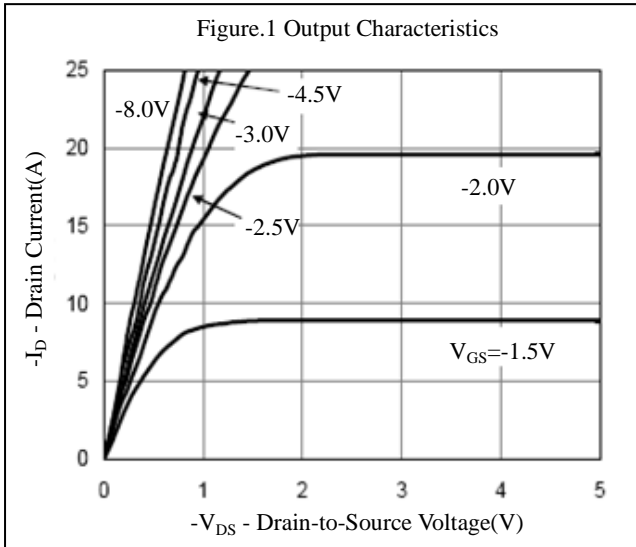
Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-16V, V _{GS} =0V	-	-	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±8V, V _{DS} =0V	-	-	±1	μA
		V _{GS} =±4.5V, V _{DS} =0V	-	-	±10	
• On Characteristics^c						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.3	-	-1	V
I _{D(on)}	On State Drain Current	V _{GS} =-4.5V, V _{DS} =-5V	-25	-	-	A
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-4A	-	36	43	mΩ
		V _{GS} =-2.5V, I _D =-4A	-	48	54	
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-4A	-	16	-	S
• Dynamic Characteristics^d						
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	-	1450	-	pF
C _{oss}	Output Capacitance		-	205	-	
C _{rss}	Reverse Transfer Capacitance		-	160	-	
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	-	6.5	-	Ω
• Switching Characteristics^d						
Q _g	Total Gate Charge	V _{DS} =-10V, I _D =-4A, V _{GS} =-4.5V	-	17.2	-	nC
Q _{gs}	Gate-Source Charge		-	1.3	-	
Q _{gd}	Gate-Drain Charge		-	4.5	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} =-10V, R _L =2.5Ω, V _{GS} =-4.5V, R _G =3Ω	-	9.5	-	nS
t _r	Turn-on Rise Time		-	17	-	
t _{d(off)}	Turn-off Delay Time		-	94	-	
t _f	Turn-off Fall Time		-	35	-	
t _{rr}	Reverse Recovery Time	I _{DS} =-4A, dI/dt=100A/μS	-	27	-	nS
Q _{rr}	Reverse Recovery Charge		-	14	-	nC
t _{rr}	Reverse Recovery Time	I _{DS} =-4A, dI/dt=100A/μS	-	31	-	nS
Q _{rr}	Reverse Recovery Charge		-	13.8	-	nC
• Drain-Source Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =-1A	-	-	-1	V
I _S	Maximum Body-Diode Continuous Current		-	-	-2.2	A

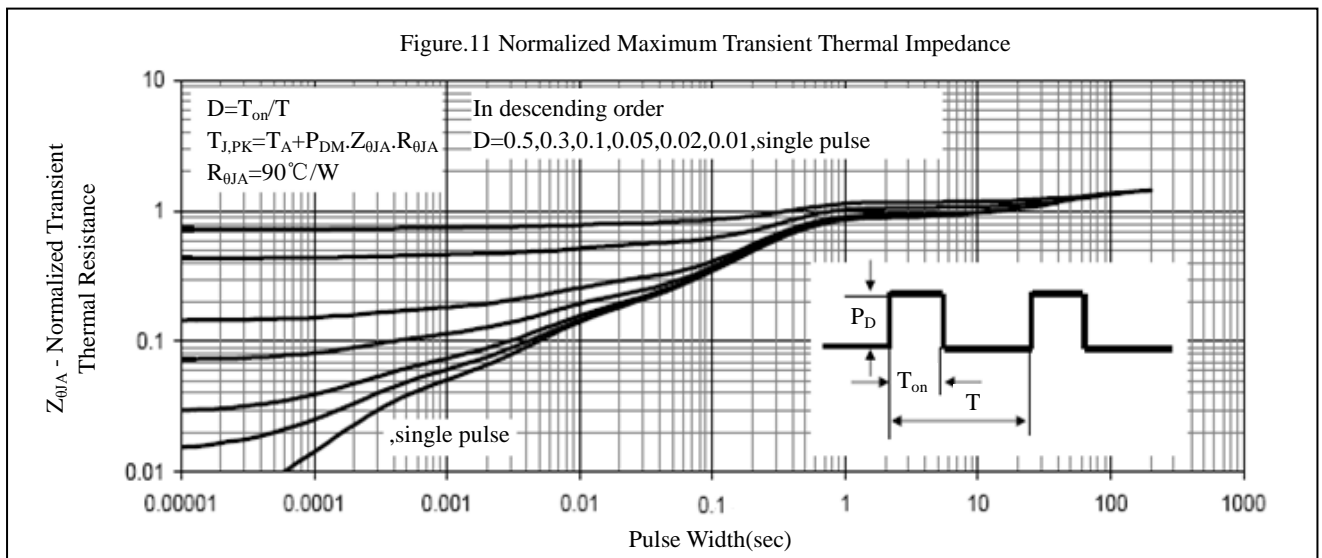
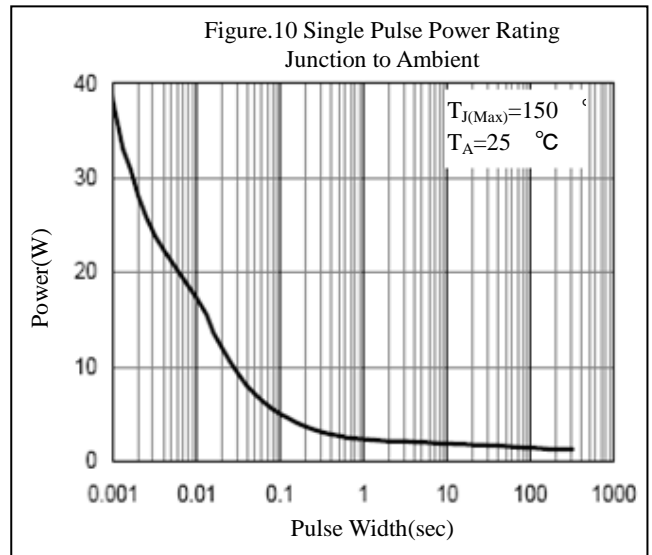
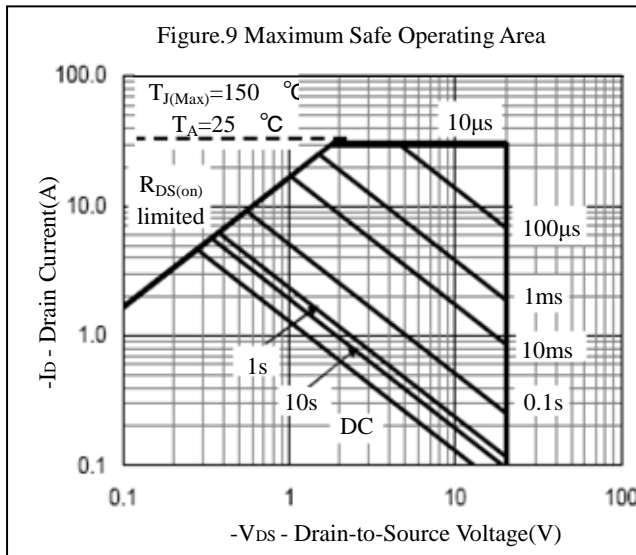
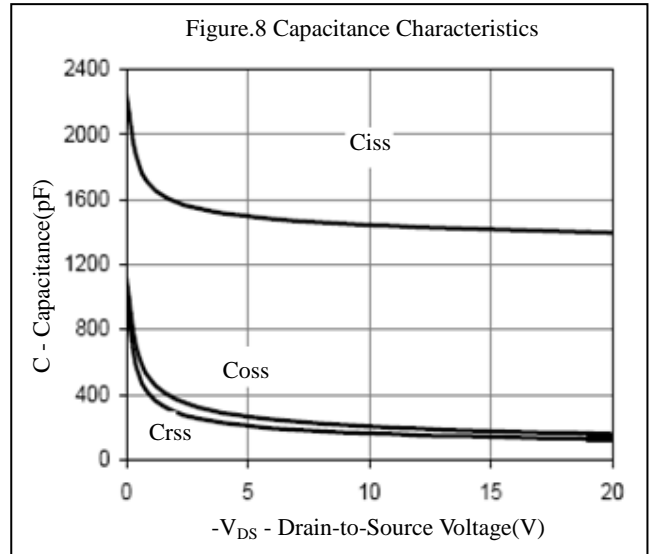
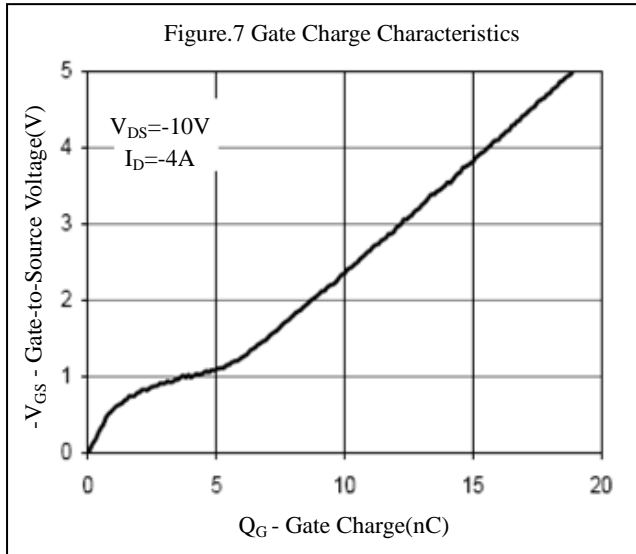
Note: c: Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%

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

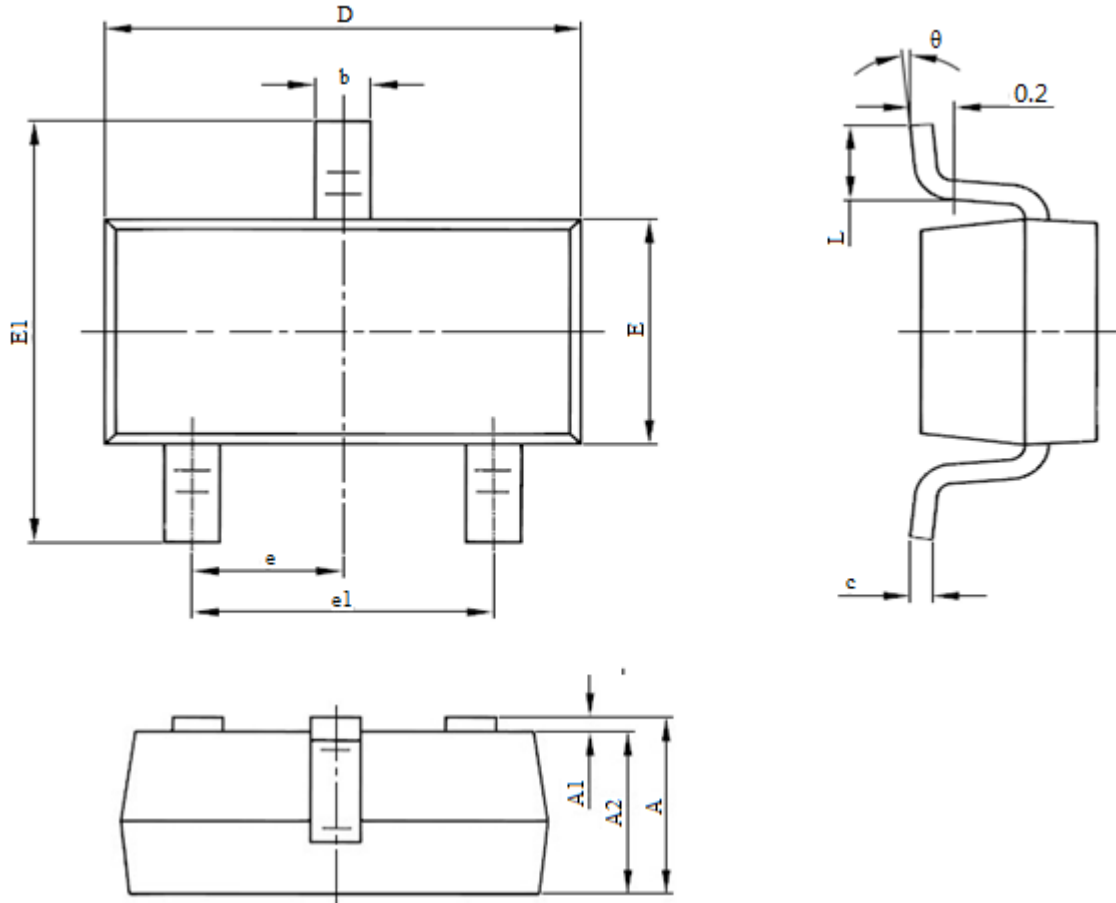
Characteristics Curve



Characteristics Curve



SOT-23-3L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.85	1.25	0.033	0.049
A1	0	0.1	0	0.004
A2	0.7	1.15	0.028	0.045
b	0.3	0.5	0.012	0.020
c	0.1	0.2	0.004	0.008
D	2.82	3.02	0.111	0.119
E	1.5	1.7	0.059	0.067
E1	2.65	2.95	0.104	0.116
e	0.95(BSC)		0.037(BSC)	
e1	1.8	2	0.071	0.079
L	0.3	0.6	0.012	0.024
θ	0°	8°	0°	8°



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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.