P＋N-Channel Enhancement Mode MOSFET

GBLH3303-S8

Features

HF

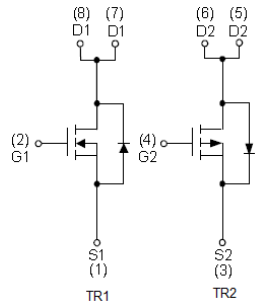
- Reliable and Rugged
- Green device available

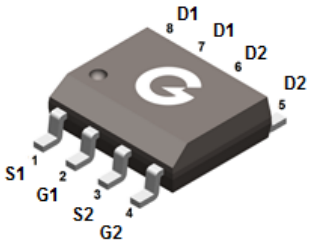
Applications

- Synchronous Rectification
- Motor Control
- Protable equipment application

Mechanical Data

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





SOP-8

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
GBLH3303-S8	SOP-8	4000 pcs / Tape & Reel	GBLH3303

Maximum Ratings (@ T_A = 25°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_A = 25°C)	I_D	9	-6.8	A
Continuous Drain Current (T_A = 100°C)		5.7	-4.3	A
Pulsed Drain Current (T_C = 25°C) *1	I_{DM}	36	27.2	A
Single Pulse Avalanche Energy*2	E_{AS}	7.8	16	mJ

Thermal Characteristics

Parameter	Symbol	N Channel	P Channel	Unit
Power Dissipation (T_A = 25°C)	P_D	2.7	2.5	W
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	46	50	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +150		°C
Storage Temperature Range	T_{STG}	-55 ~ +150		°C

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						
$R_{DS(ON)}$	Static Drain-Source On-resistance *4	V_{GS} = 10V,I_D = 5A	-	18	21	mΩ
		V_{GS} = 4.5V,I_D = 3A	-	24	33	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1	1.5	2	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	-	480	-	pF
C_{OSS}	Output Capacitance		-	70	-	
C_{RSS}	Reverse Transfer Capacitance		-	61	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{GS} = 10V V_{DD} = 15V I_D = 10A R_G = 3Ω	-	1.6	-	ns
t_r	Turn-on Rise Time		-	25.6	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	16.6	-	
t_f	Turn-Off Fall Time		-	9	-	
Q_G	Total Gate-Charge	V_{DD} = 15V V_{GS} = 10V I_D = 10A	-	10.3	-	nC
Q_{GS}	Gate to Source Charge		-	1.27	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	3.2	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *4	I_{SD} = 20A, V_{GS} = 0V, T_J = 25°C	-	1.0	1.2	V
trr	Reverse Recovery Time	I_F = 10 A, V_{GS} = 0V dI_F/dt = 100 A/μs	-	93	-	ns
Qrr	Reverse Recovery Charge		-	53.5	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. E_{AS} condition : T_J = 25℃,V_{DD} = 20V, V_G= 10V, L = 0.5mH
3. Pulse test ; pulse width≤300μs, duty cycle≤2%

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						
$R_{DS(ON)}$	Static Drain-Source On-resistance *3	V_{GS} = -10V, I_D = -7A	-	28	35	mΩ
		V_{GS} = -4.5V, I_D = -4A	-	39	54	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	V_{GS} = -10V V_{DD} = -15V I_D = -7A R_G = 2.5Ω	-	11	-	ns
t_r	Turn-on Rise Time		-	19	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	45	-	
t_f	Turn-Off Fall Time		-	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	I_{SD} = -20A, V_{GS} = 0V	-	-1.1	-1.2	V

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

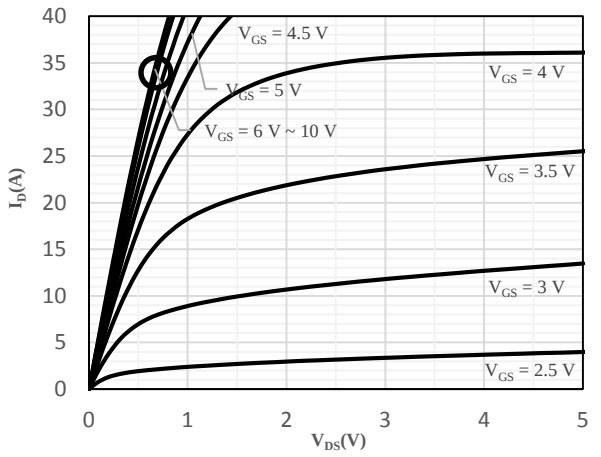


Fig 1 Typical Output Characteristics

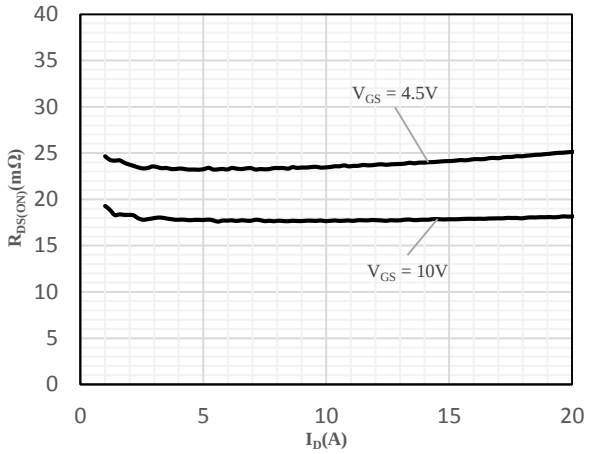


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

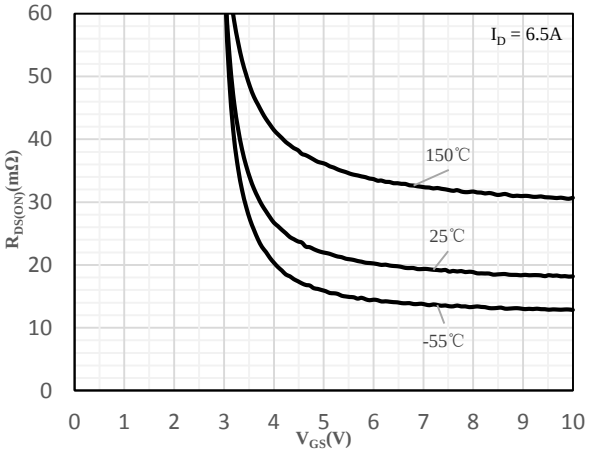


Fig 3 On-Resistance vs. Gate-Source Voltage

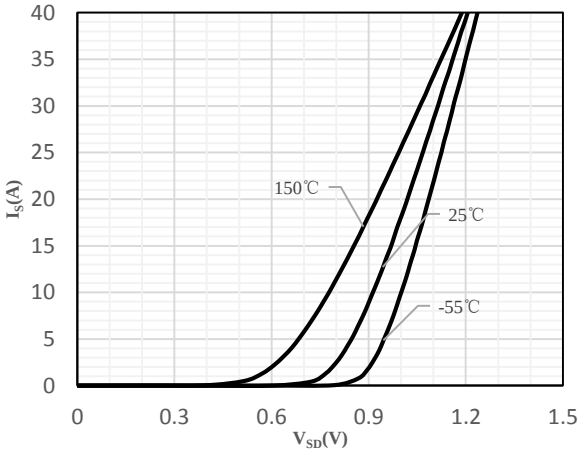


Fig 4 Body-Diode Characteristics

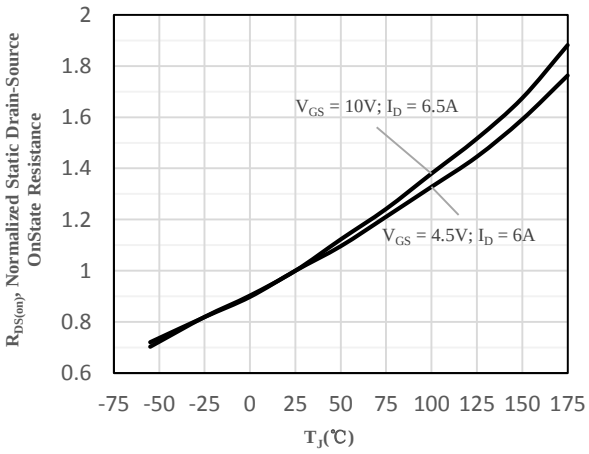


Fig 5 Normalized On-Resistance vs. Junction Temperature

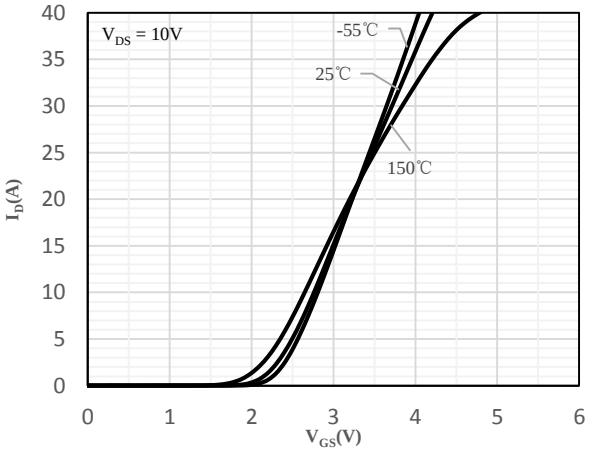


Fig 6 Transfer Characteristics

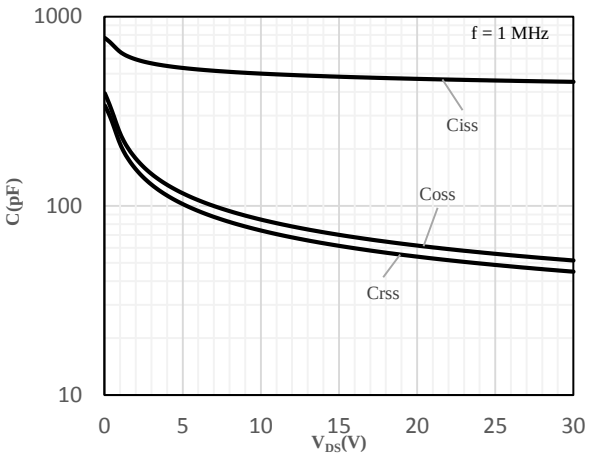


Fig 7 Capacitance Characteristics

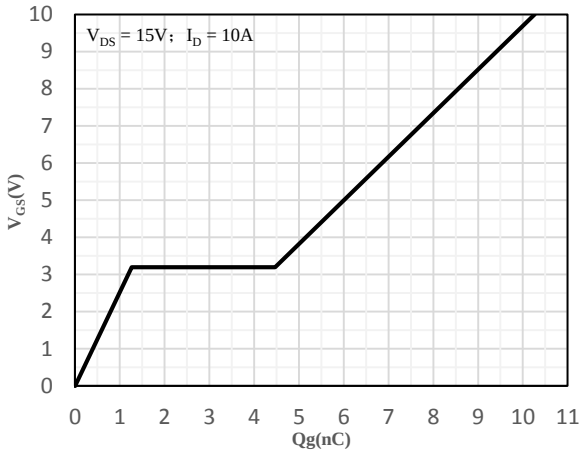


Fig 8 Gate-Charge Characteristics

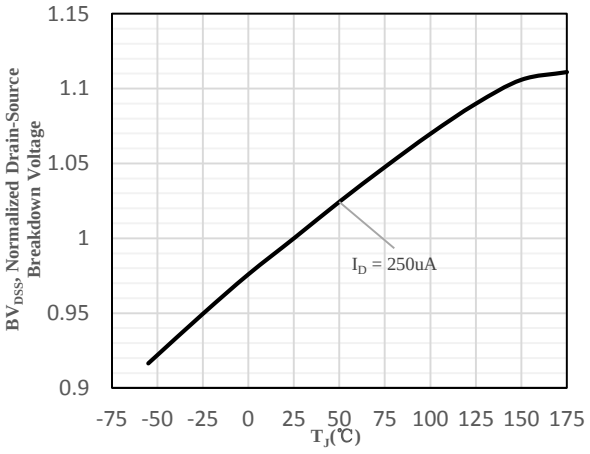


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

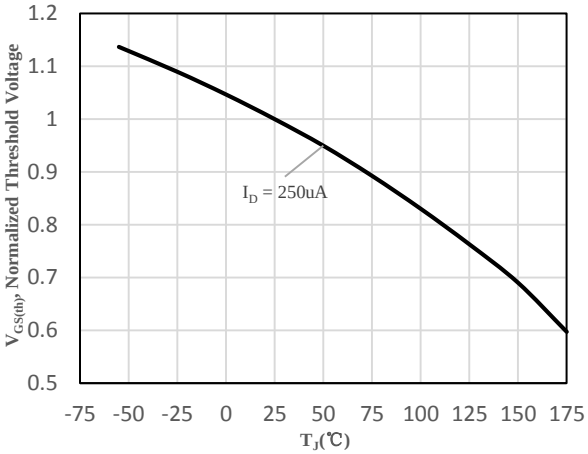


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

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

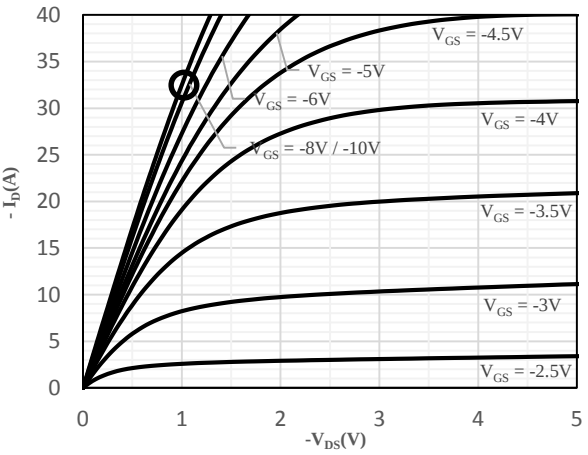


Fig 1 Typical Output Characteristics

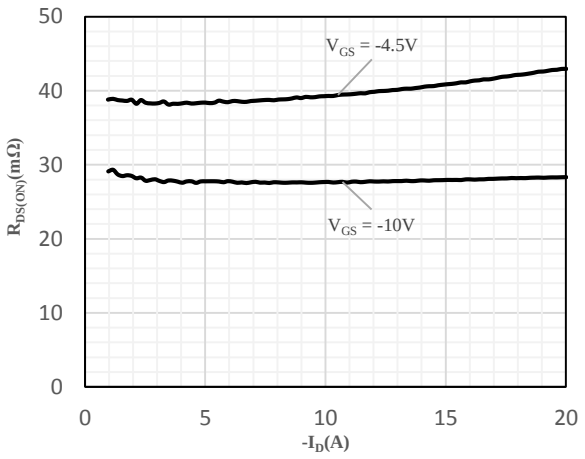


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

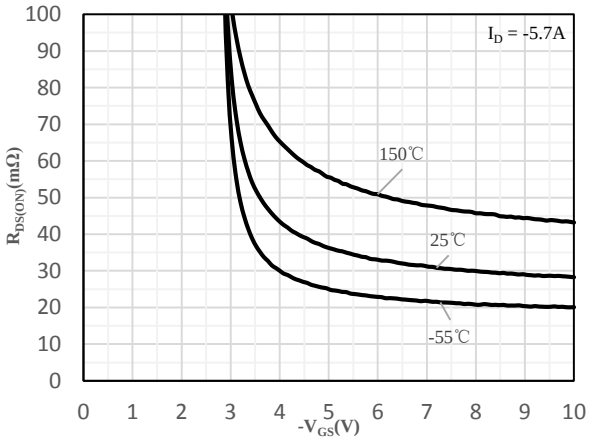


Fig 3 On-Resistance vs. Gate-Source Voltage

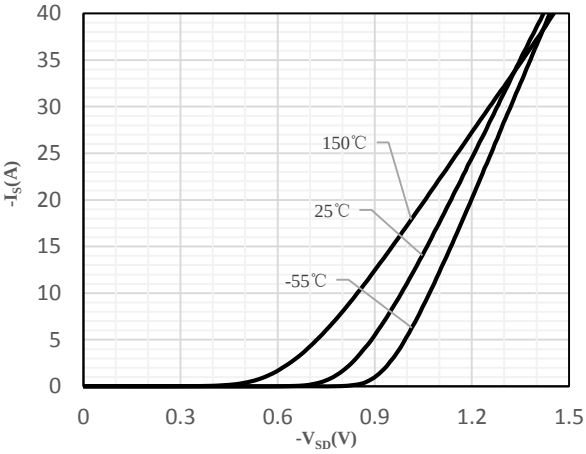


Fig 4 Body-Diode Characteristics

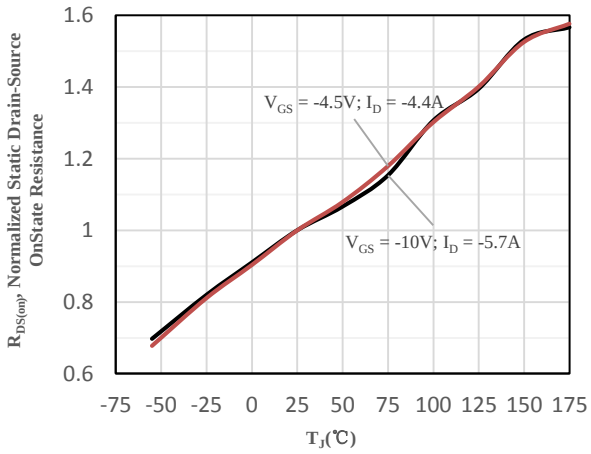


Fig 5 Normalized On-Resistance vs. Junction Temperature

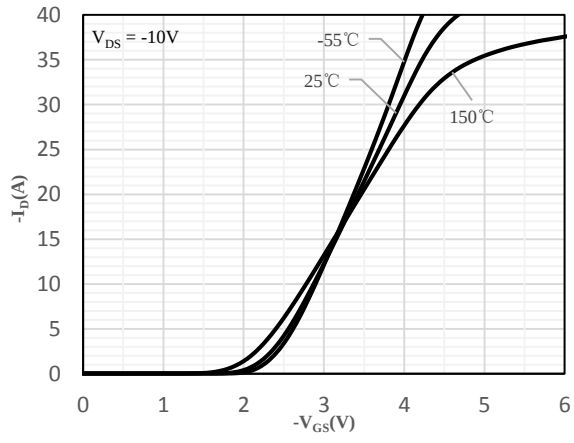


Fig 6 Transfer Characteristics

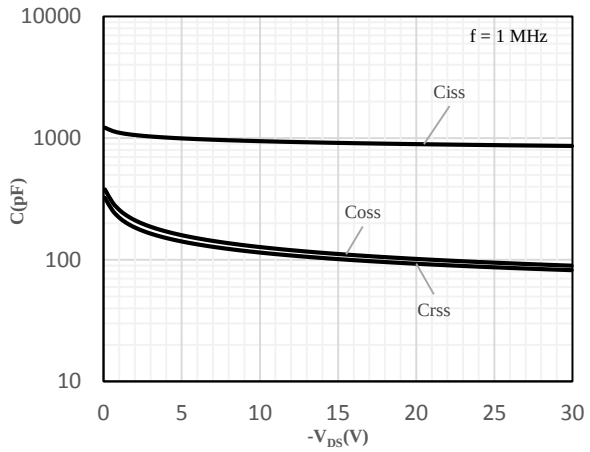


Fig 7 Capacitance Characteristics

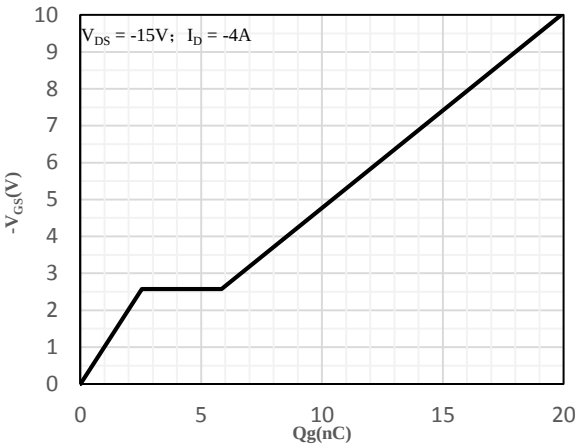


Fig 8 Gate-Charge Characteristics

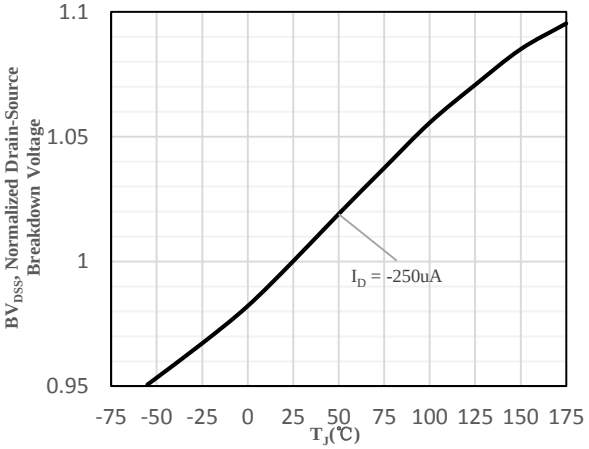


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

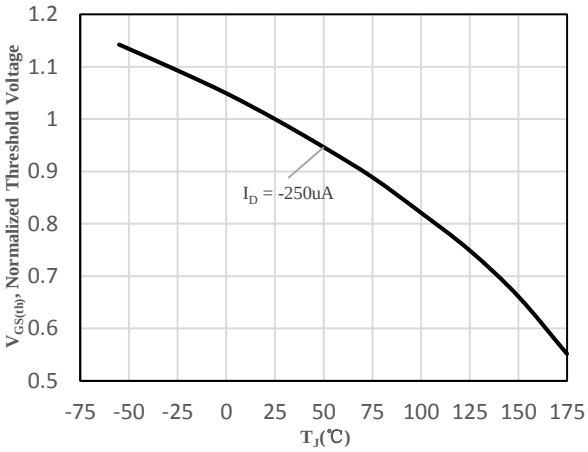
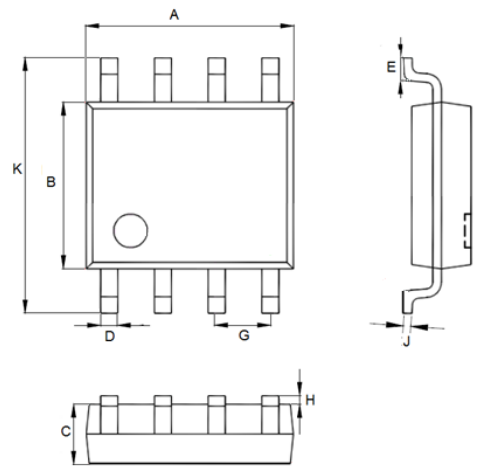


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

Package Outline Dimensions (Unit: mm)



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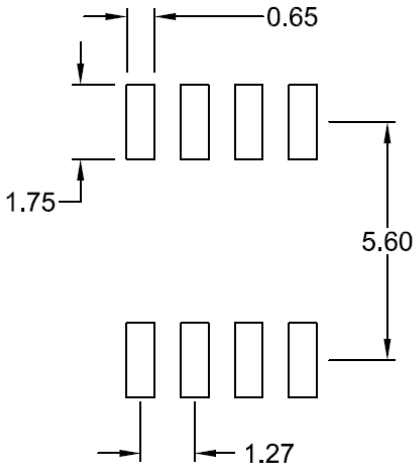
Dimension	**Min.**	**Max.**
A	4.70	5.10
B	3.8	4.0
C	1.35	1.55
D	0.33	0.51
E	0.40	1.27
G	1.17	1.37
H	0.10	0.25
J	0.10	0.30
K	5.80	6.20

Mounting Pad Layout (Unit: mm)

SOP-8



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