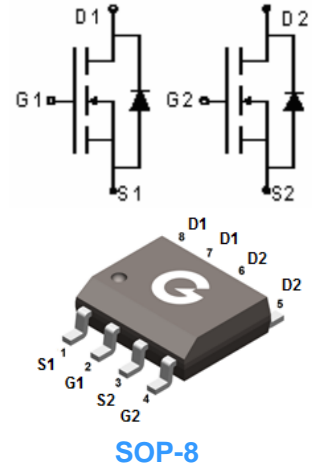


### Features

- Advanced trench technology
- Small Surface Mount Package
- Low on-resistance
- Low gate charge
- HBM: JESD22-A114-B: 1B

HF



### 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

### Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
GBLN4404-S8	SOP-8	4000 pcs / Tape & Reel	GBLN4404

### Maximum Ratings (@ T<sub>A</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>	40	V
Gate-to-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (T <sub>C</sub> = 25°C)	I <sub>D</sub>	20	A
Continuous Drain Current (T <sub>A</sub> = 25°C) *1		10.7	A
Continuous Drain Current (T <sub>A</sub> = 100°C) *1		6.8	A
Pulsed Drain Current (t <sub>p</sub> = 10μs, T <sub>A</sub> = 25°C)	I <sub>DM</sub>	85	A
Single Pulse Avalanche Energy *3	E <sub>AS</sub>	33	mJ
Single Pulse Avalanche Current	I <sub>AS</sub>	27	A
Power Dissipation (T <sub>C</sub> = 25°C)	P <sub>D</sub>	9.6	W
Power Dissipation (T <sub>A</sub> = 25°C) *1		2.8	W
Operating Junction Temperature Range	T <sub>J</sub>	-55 ~ +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 ~ +150	°C

### Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	R <sub>θJC</sub>	-	-	13	°C/W
Thermal Resistance Junction-to-Air *1	R <sub>θJA</sub>	-	-	45	°C/W

### Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
$V_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	40	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 32V, V_{GS} = 0V$	-	-	1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$R_{DS(ON)}$	Drain-Source On-resistance <sup>*2</sup>	$V_{GS} = 10V, I_D = 5A$	-	11	15	m $\Omega$
		$V_{GS} = 4.5V, I_D = 4A$	-	13	19	m $\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.8	2.5	V
$R_G$	Gate Resistance	$V_{GS} = 0V, f = 1MHz$	-	3.2	-	$\Omega$
<b>Dynamic Characteristics</b>						
$C_{ISS}$	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 15V$ $f = 1.0MHz$	-	1726	-	pF
$C_{OSS}$	Output Capacitance		-	180	-	
$C_{RSS}$	Reverse Transfer Capacitance		-	162	-	
<b>Switching Characteristics</b>						
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD} = 30V$ $V_{GS} = 15V$ $I_D = 10A$ $R_G = 2\Omega$	-	5	-	ns
$t_r$	Turn-on Rise Time		-	26	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	39	-	
$t_f$	Turn-Off Fall Time		-	30	-	
$Q_G$	Total Gate-Charge	$V_{DD} = 20V$ $V_{GS} = 4.5V$ $I_D = 20A$	-	19.3	-	nC
$Q_{GS}$	Gate to Source Charge		-	5.5	-	
$Q_{GD}$	Gate to Drain (Miller) Charge		-	9.3	-	
<b>Source-Drain Diode Characteristics</b>						
$V_{SD}$	Diode Forward Voltage <sup>*2</sup>	$I_{SD} = 1A, V_{GS} = 0V$	-	0.7	1.2	V
$t_{rr}$	Reverse Recovery Time	$V_{GS} = 0V, I_F = 12A$ $di_F/dt = 100A/\mu s$	-	35	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	18	-	nC

Notes:

- The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper
- The data tested by pulsed, pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
- The  $E_{AS}$  data shows Max. rating. The test condition is  $V_{DD} = 25V, V_{GS} = 10V, L = 0.1mH$

Ratings and Characteristics Curves (@  $T_A = 25^\circ\text{C}$  unless otherwise specified)

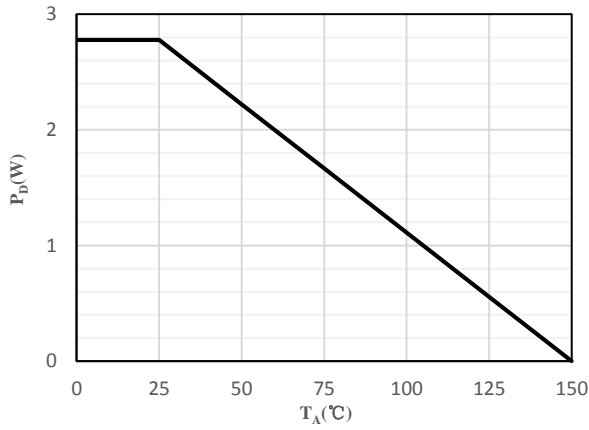


Fig 1 Power Dissipation

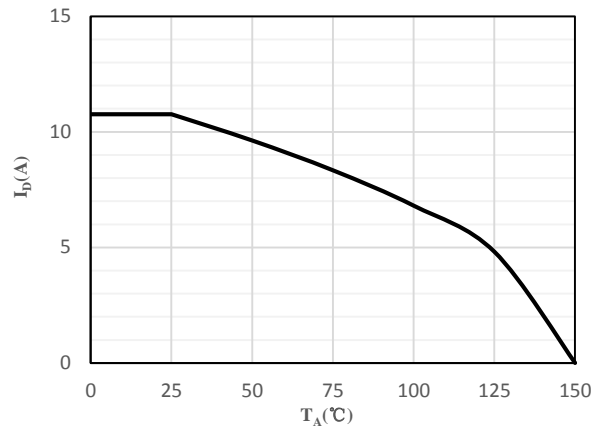


Fig 2 Drain Current

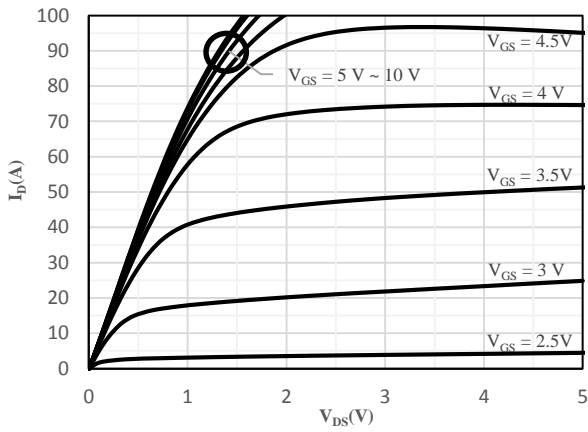


Fig 3 Typical Output Characteristics

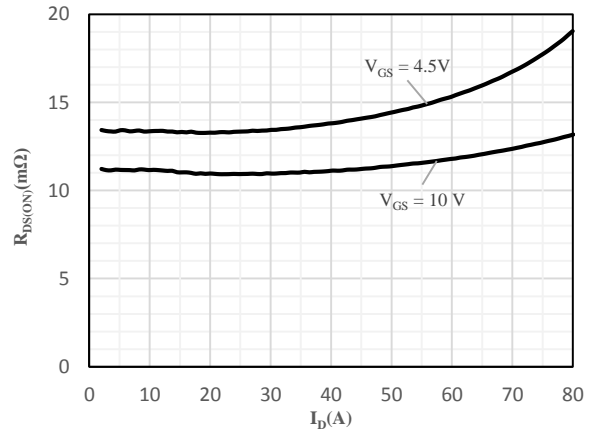


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

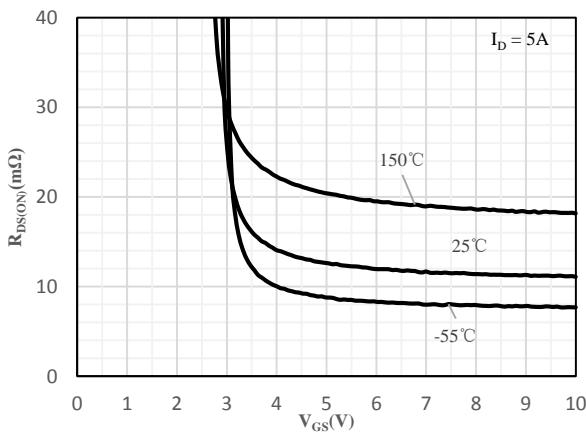


Fig 5 On-Resistance vs. Gate-Source Voltage

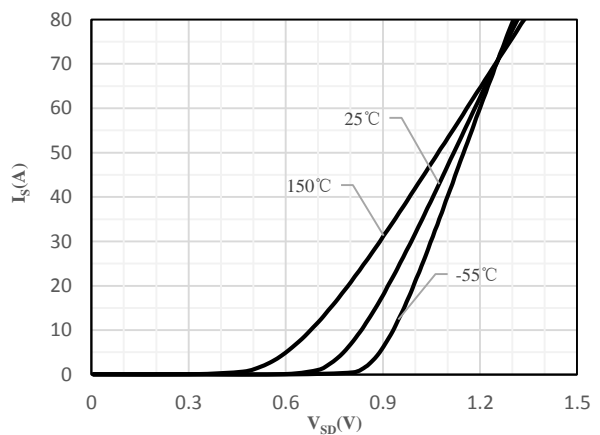


Fig 6 Body-Diode Characteristics

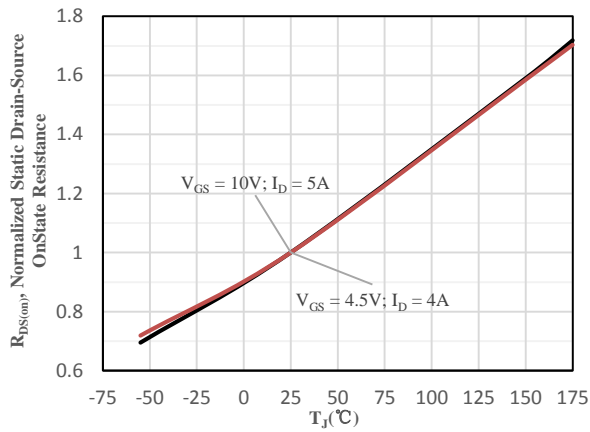


Fig 7 Normalized On-Resistance vs. Junction Temperature

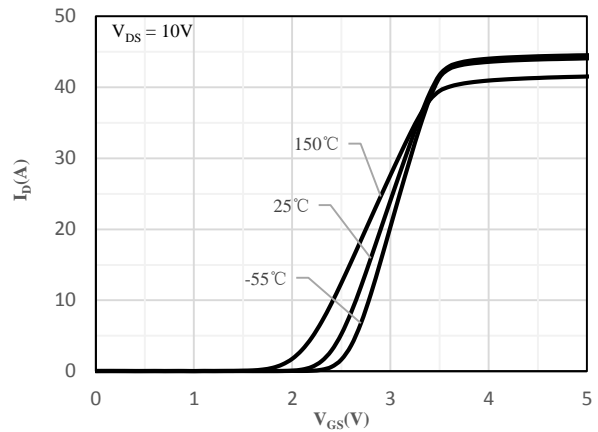


Fig 8 Transfer Characteristics

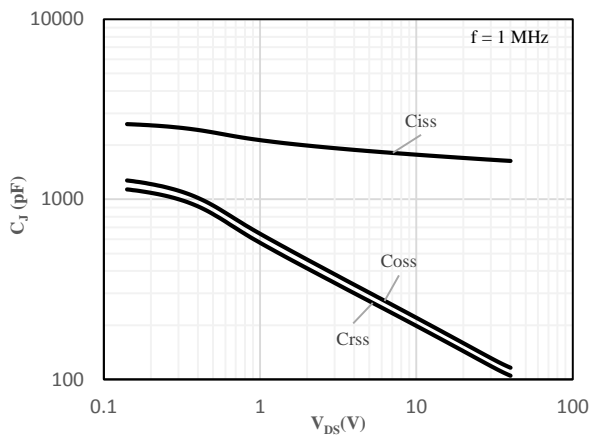


Fig 9 Capacitance Characteristics

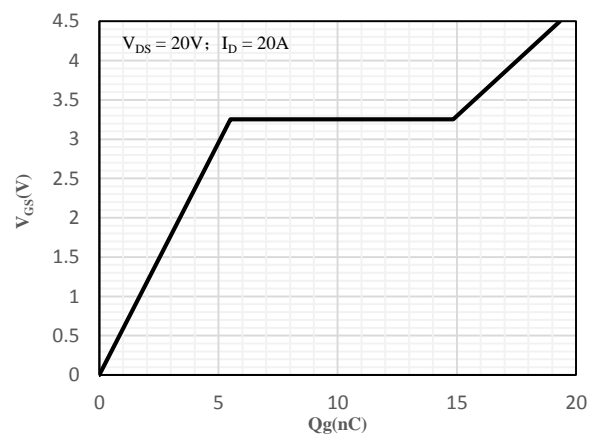


Fig 10 Gate-Charge Characteristics

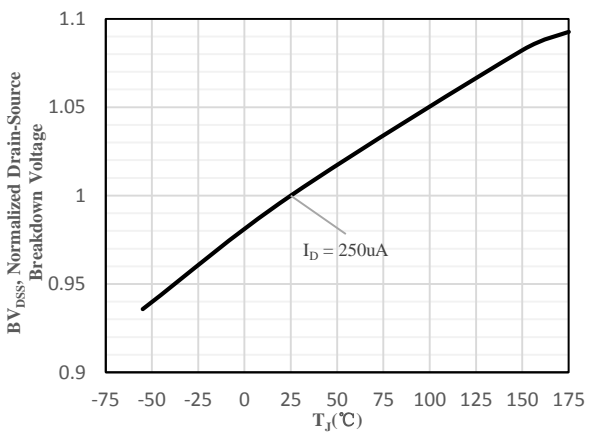


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

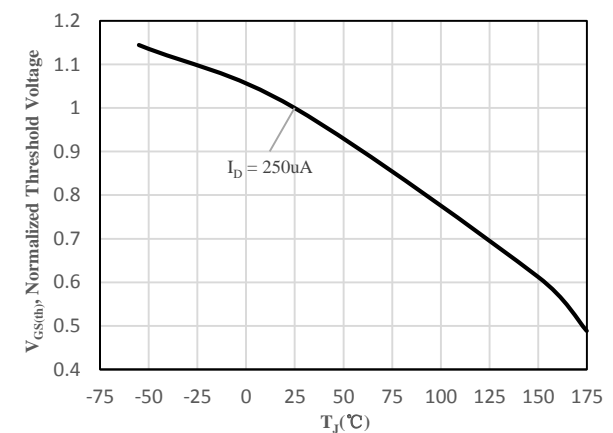
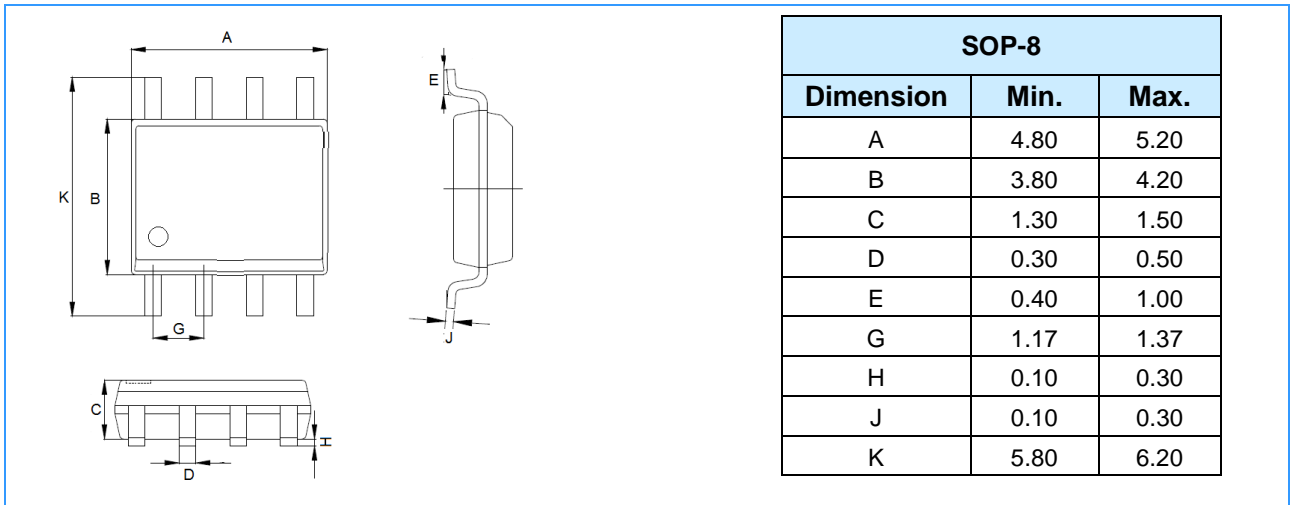
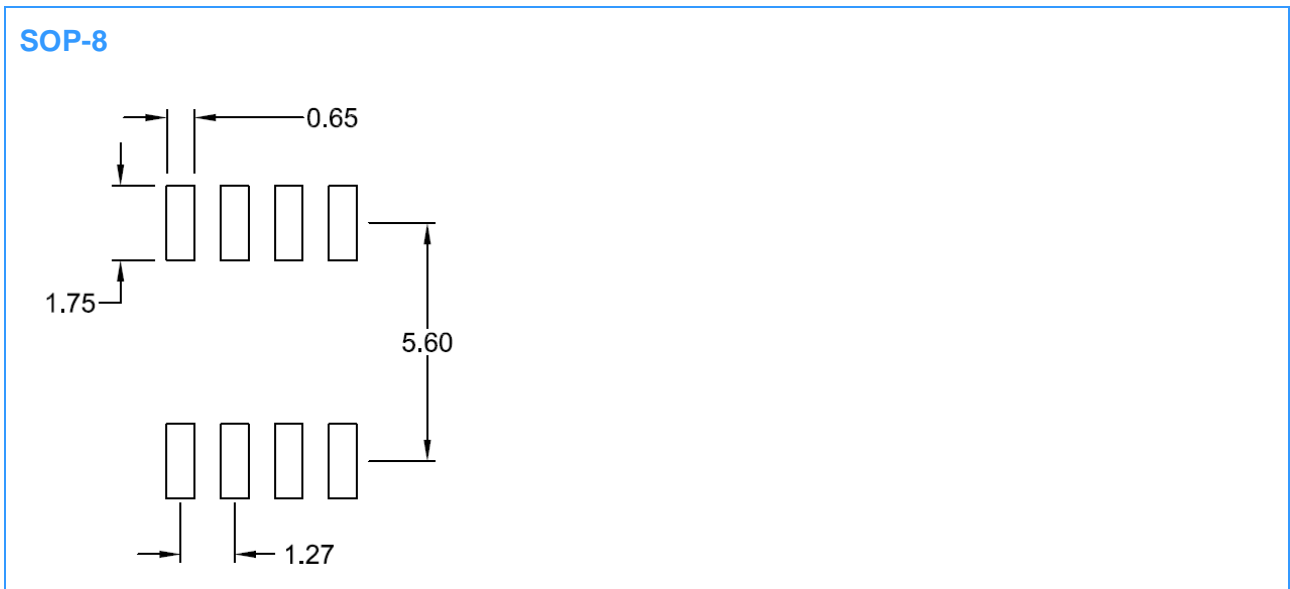


Fig 12 Normalized  $V_{GS(th)}$  vs. Junction Temperature

**Package Outline Dimensions** (Unit: mm)



**Mounting Pad Layout** (Unit: mm)



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