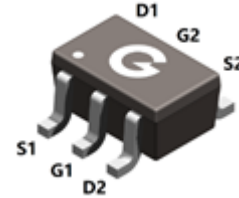
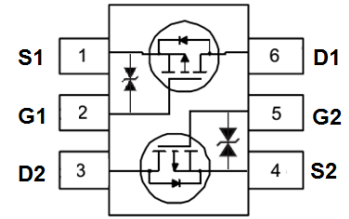


Features

- Advanced trench technology
- Low On-Resistance
- Low gate threshold voltage
- Low input capacitance
- Fast switching speed
- HBM: JESD22-A114-B: 2
- RoHS compliant with Halogen-free

HF



SOT-363

Mechanical Data

- Case: SOT-363
- 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
BL1013DW	SOT-363	3000 pcs / Tape & Reel	PA1

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V _{DSS}	-20	V
Gate-to-Source Voltage	V _{GSS}	±12	V
Continuous Drain Current (T _A = 25°C) *1	I _D	-0.78	A
Continuous Drain Current (T _A = 70°C) *1		-0.62	A
Pulsed Drain Current (t _p = 10μs, T _A = 25°C)	I _{DM}	-4.9	A
Single Pulse Avalanche Energy *3	E _{AS}	0.5	mJ
Power Dissipation (T _C = 25°C)	P _D	0.54	W
Power Dissipation (T _A = 25°C) *1		0.3	W
Operating Junction Temperature Range	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	R _{θJC}	-	-	230	°C/W
Thermal Resistance Junction-to-Air *1	R _{θJA}	-	-	417	°C/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -20V, V_{GS} = 0V$	-	-	-1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm 4.5V, V_{DS} = 0V$	-	-	± 10	μA
On Characteristics						
$R_{DS(ON)}$	Drain-Source On-resistance *2	$V_{GS} = -4.5V, I_D = -780mA$	-	0.4	0.48	Ω
		$V_{GS} = -2.5V, I_D = -660mA$	-	0.6	0.67	
		$V_{GS} = -1.8V, I_D = -100mA$	-	0.75	2.2	
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.45	-0.6	-1.2	V
R_G	Gate Resistance	$V_{GS} = 0V, f = 1MHz$	-	94	-	Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = -16V$ $f = 1.0MHz$	-	76	-	μF
C_{OSS}	Output Capacitance		-	13	-	
C_{RSS}	Reverse Transfer Capacitance		-	10	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time *4	$V_{DD} = -10V$ $V_{GS} = -4.5V$ $R_G = 3\Omega$ $R_G = 50\Omega$	-	8	-	ns
t_r	Turn-on Rise Time *4		-	5.5	-	
$t_{d(OFF)}$	Turn-Off Delay Time *4		-	30	-	
t_f	Turn-Off Fall Time *4		-	17	-	
Q_G	Total Gate-Charge	$V_{DS} = -16V$ $V_{GS} = -4.5V$ $I_D = -0.2A$	-	2.6	-	nC
Q_{GS}	Gate to Source Charge		-	0.57	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	0.34	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	$I_S = -0.35A, V_{GS} = 0V$	-	-0.8	-1.2	V

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The E_{AS} data shows Max. rating. The test condition is $V_{DD} = -15V, V_{GS} = -5V, L = 0.1mH$
4. Guaranteed by design, not subject to production

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

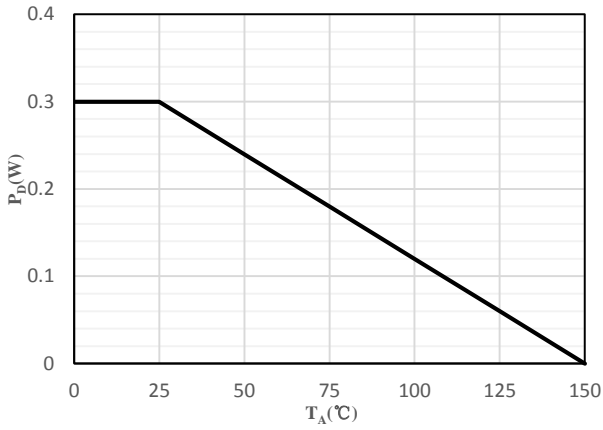


Fig 1 Power Dissipation

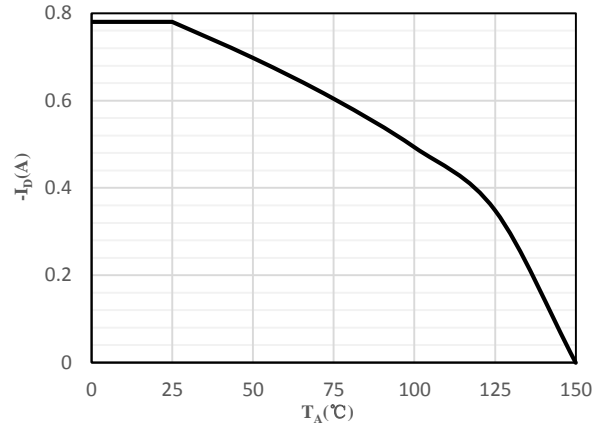


Fig 2 Drain Current

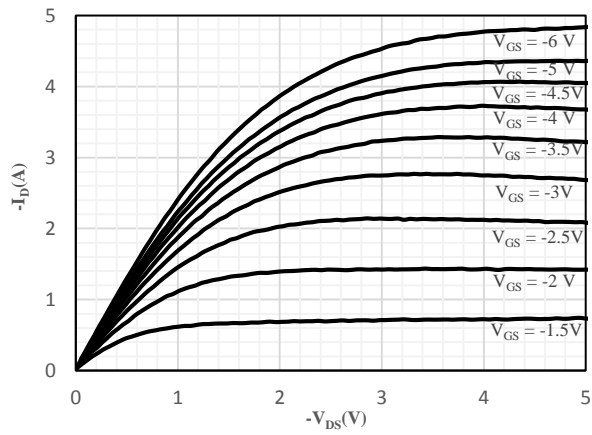


Fig 3 Typical Output Characteristics

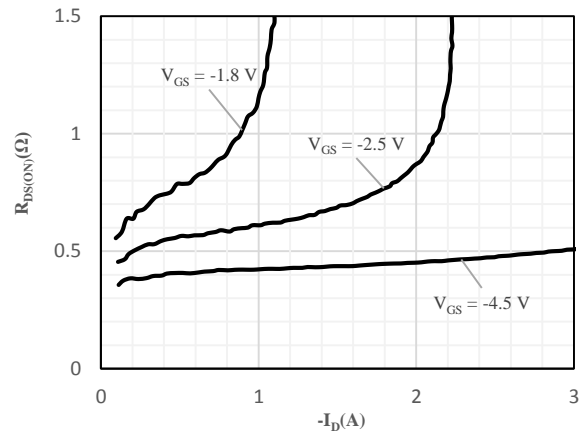


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

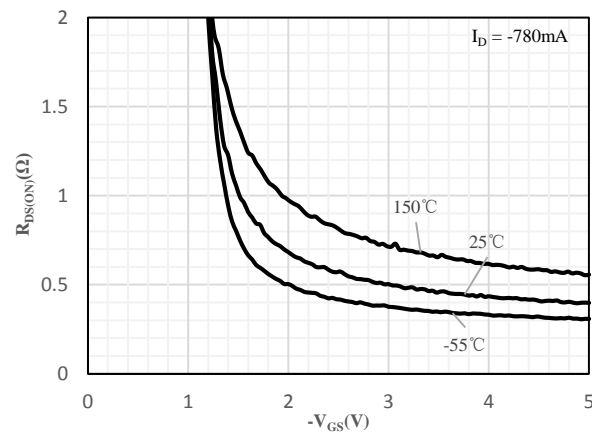


Fig 5 On-Resistance vs. Gate-Source Voltage

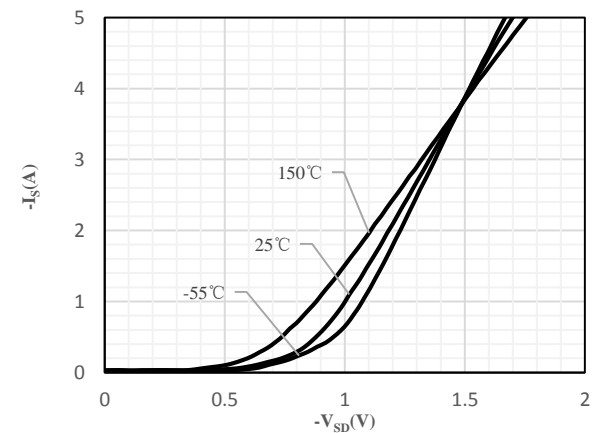


Fig 6 Body-Diode Characteristics

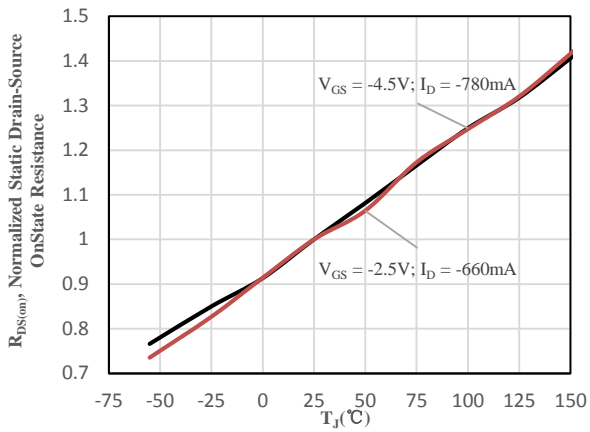


Fig 7 Normalized On-Resistance vs. Junction Temperature

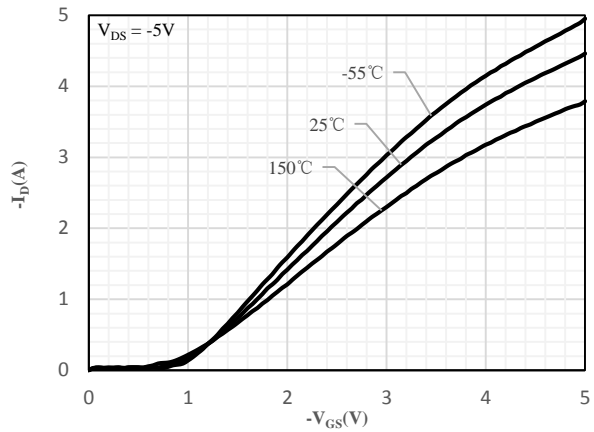


Fig 8 Transfer Characteristics

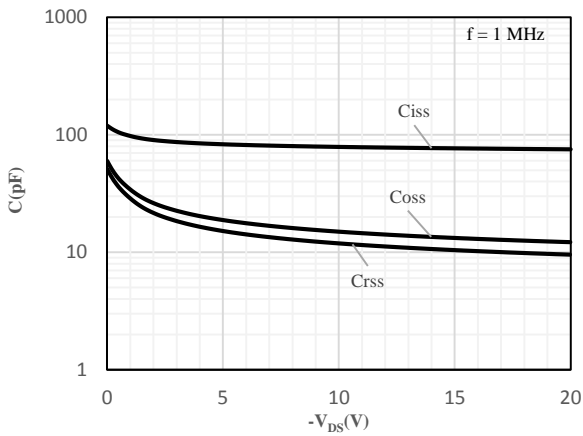


Fig 9 Capacitance Characteristics

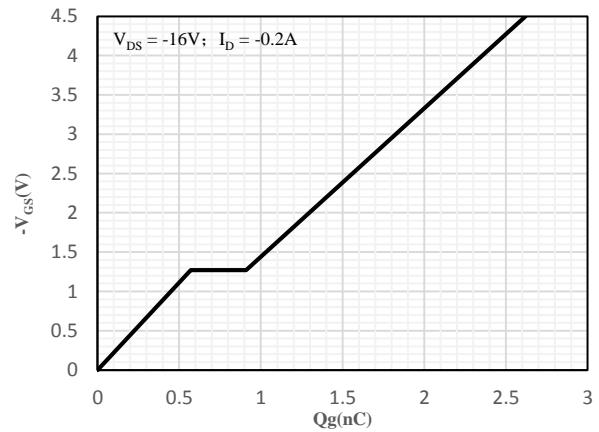


Fig 10 Gate-Charge Characteristics

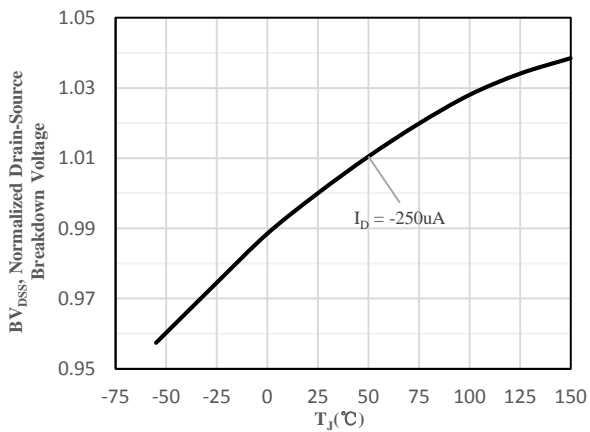


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

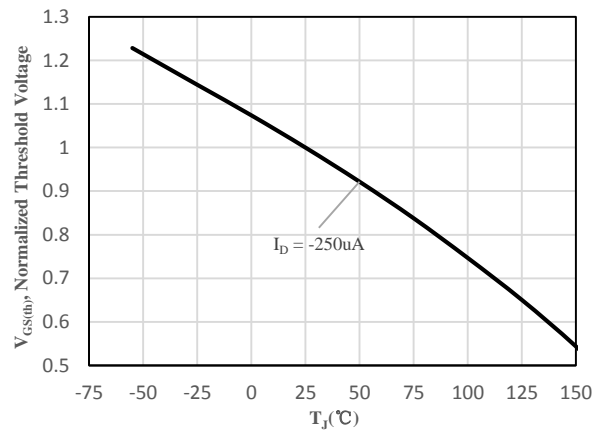
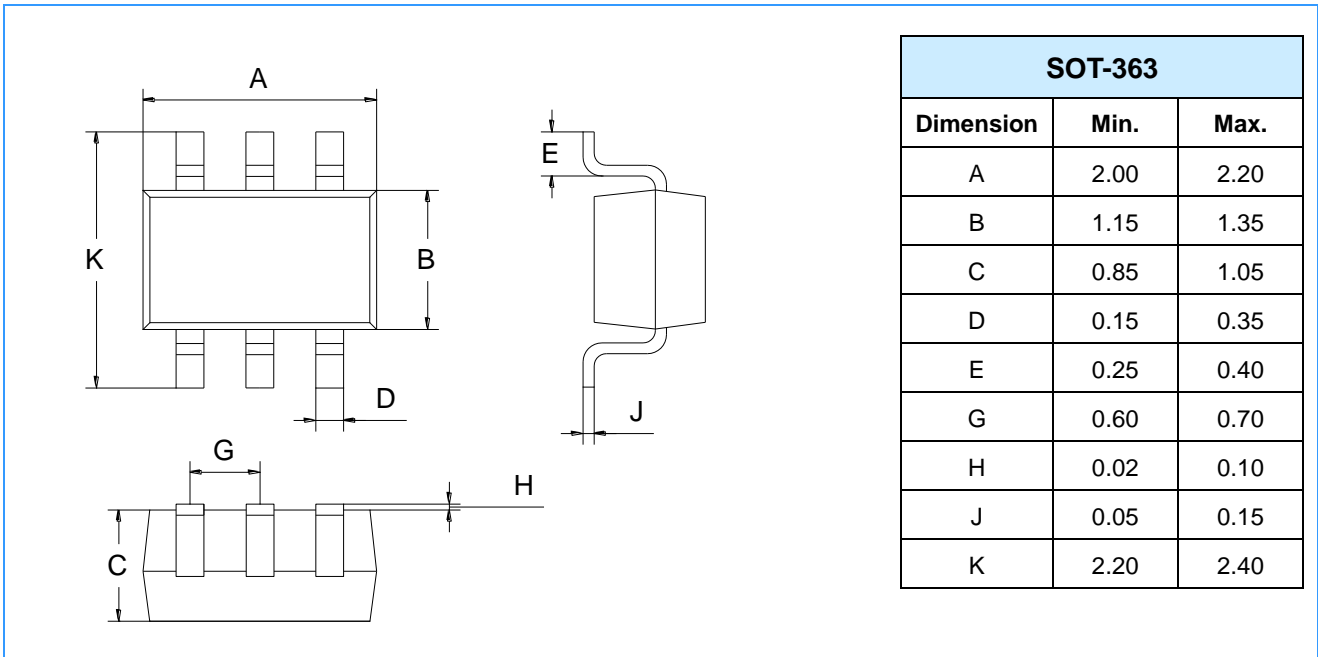


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)

