

Features

- N-Channel switch with low $R_{DS(on)}$
- Operated at low logic level gate drive
- JESD22-A114-B ESD rating of class 2 per human body model

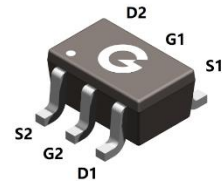
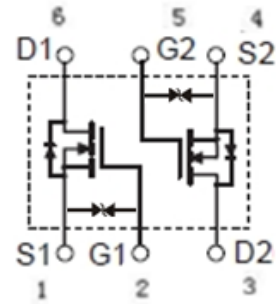
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Typical Applications

- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

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



SOT-363

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL1012DW	SOT-363	3000 pcs / Tape & Reel	1012

Maximum Ratings

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	20	V
Gate -Source Voltage	V_{GSS}	± 10	V
Continuous Drain Current	I_D	0.75	A
Power Dissipation ^{**1}	P_D	0.15	W

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-to-Air ^{**1}	$R_{\theta JA}$	833	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$

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}	Drain to Source Leakage Current	$V_{DS} = 20V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Gate-body Leakage	$V_{GS} = \pm 10V, V_{DS} = 0V$	-	-	± 10	μA
On Characteristics						
$R_{DS(ON)}$	Drain-Source On-resistance ^{*2}	$V_{GS} = 4.5V, I_D = 0.65A$	-	-	0.38	Ω
		$V_{GS} = 2.5V, I_D = 0.55A$	-	-	0.45	
		$V_{GS} = 1.8V, I_D = 0.45A$	-	-	0.8	
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.35	0.65	1.1	V
R_G	Gate Resistance	$V_{GS} = 0V, f = 1MHz$	-	115	-	Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 10V$ $f = 1.0MHz$	-	67	-	μF
C_{OSS}	Output Capacitance		-	19	-	
C_{RSS}	Reverse Transfer Capacitance		-	6	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time ^{*3}	$V_{DD} = 10V, I_D = 0.5A$ $V_{GS} = 4.5V, R_G = 1\Omega$	-	11	-	ns
t_r	Turn-on Rise Time ^{*3}		-	16	-	
$t_{d(OFF)}$	Turn-Off Delay Time ^{*3}		-	26	-	
t_f	Turn-Off Fall Time ^{*3}		-	11	-	
Q_G	Total Gate Charge	$V_{DD} = 10V$	-	2.35	-	nC
Q_{GS}	Gate-Source Charge	$I_D = 0.5A$	-	0.22	-	
Q_{GD}	Gate-Drain Charge	$V_{GS} = 4.5V$	-	0.21	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage ^{*2}	$I_S = 0.15A, V_{GS} = 0V$	-	0.8	1.2	V

Notes:

- 1、 Surface mounted on FR4 board, $t \leq 10$ sec
- 2、 Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 3、 Guaranteed by design, not subject to production

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

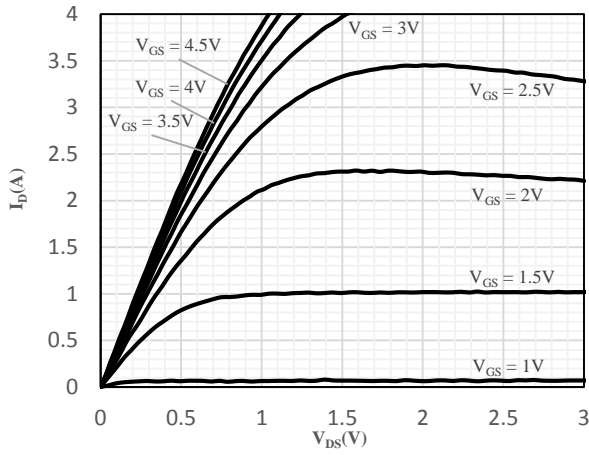


Fig 1 Typical Output Characteristics

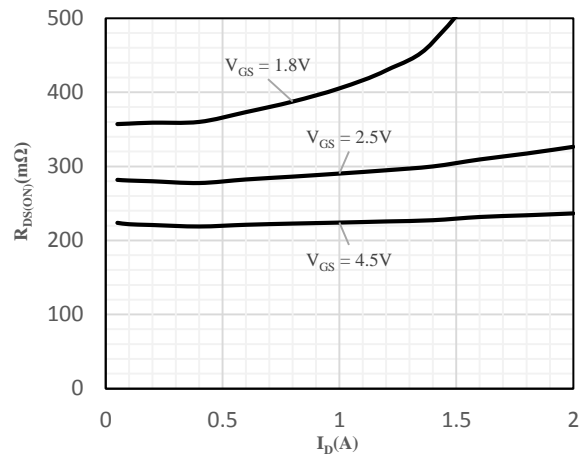


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

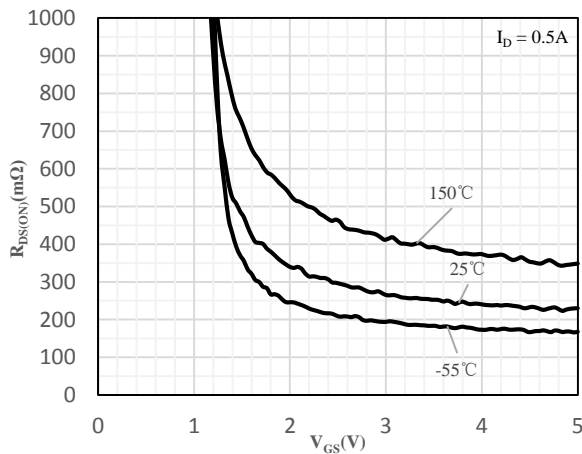


Fig 3 On-Resistance vs. Gate-Source Voltage

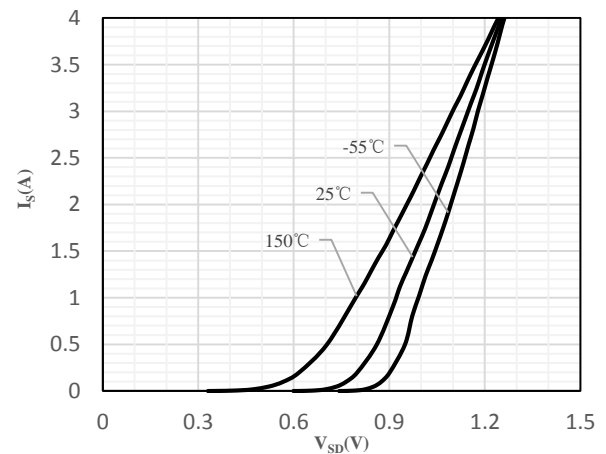


Fig 4 Body-Diode Characteristics

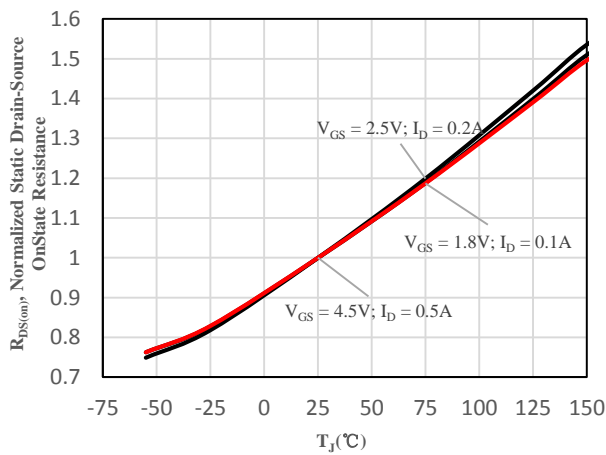


Fig 5 Normalized On-Resistance vs. Junction Temperature

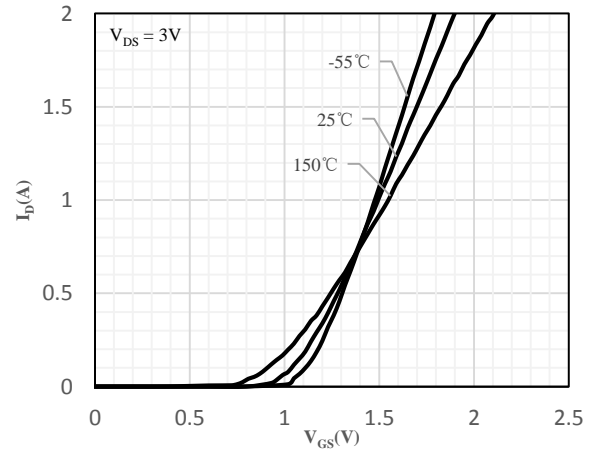


Fig 6 Transfer Characteristics

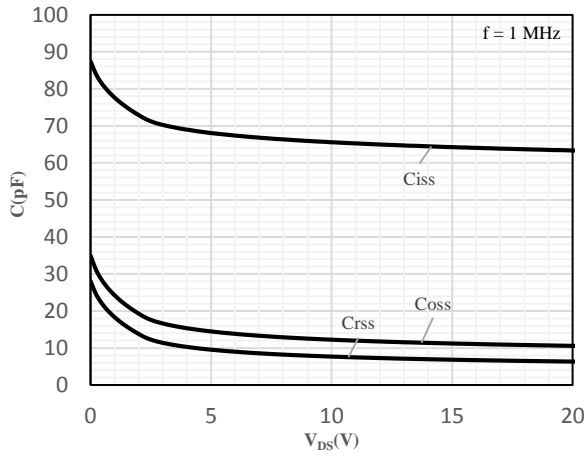


Fig 7 Capacitance Characteristics

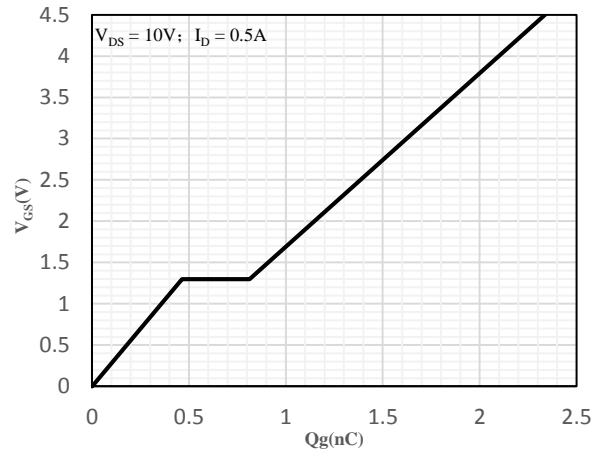


Fig 8 Gate-Charge Characteristics

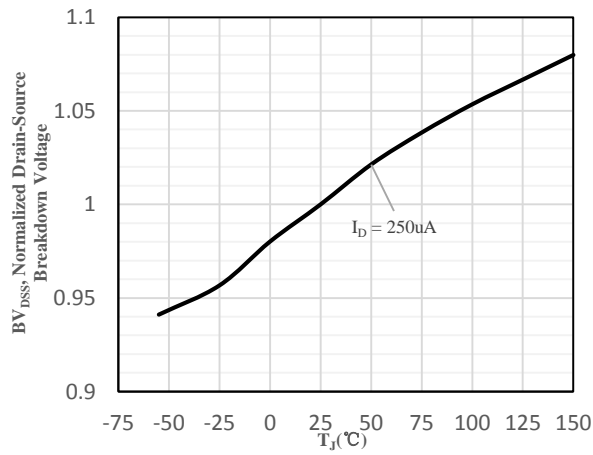


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

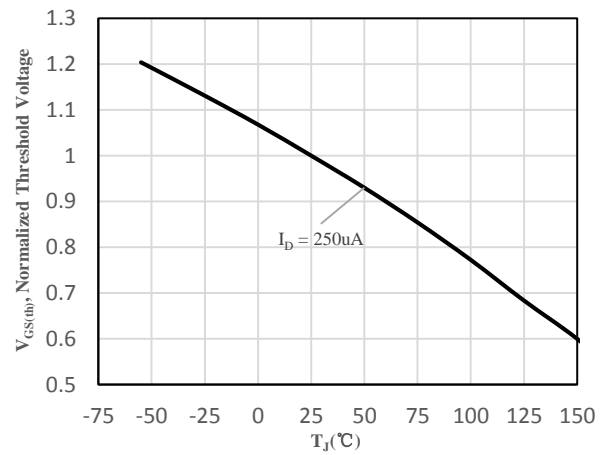
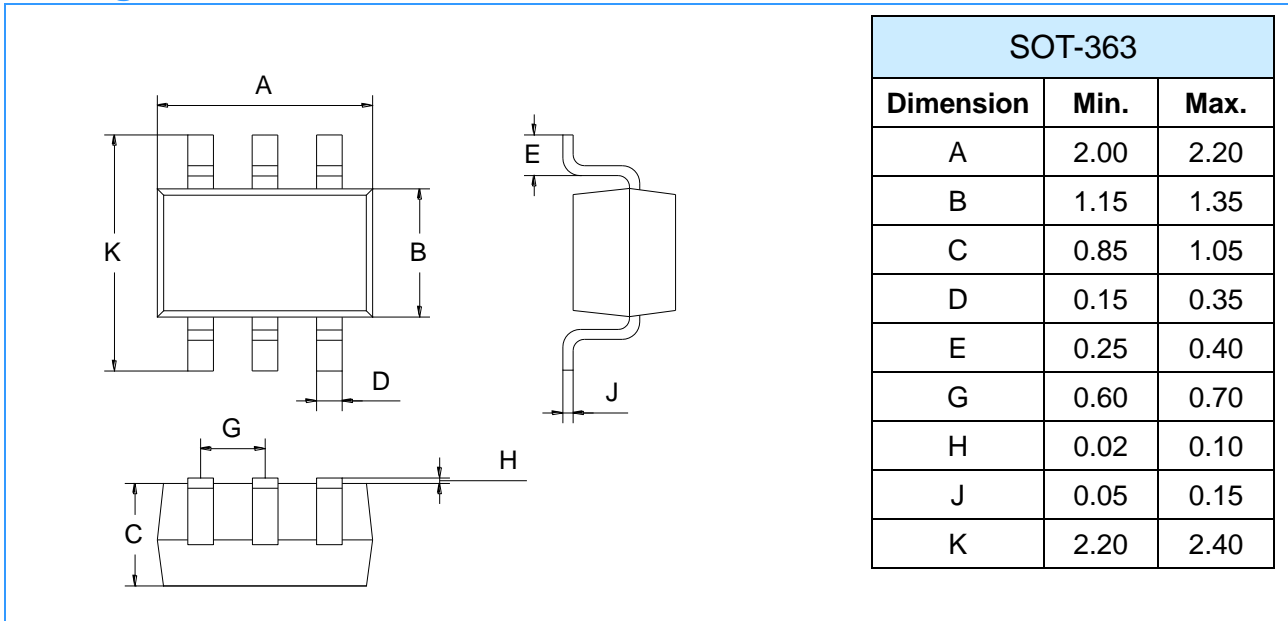
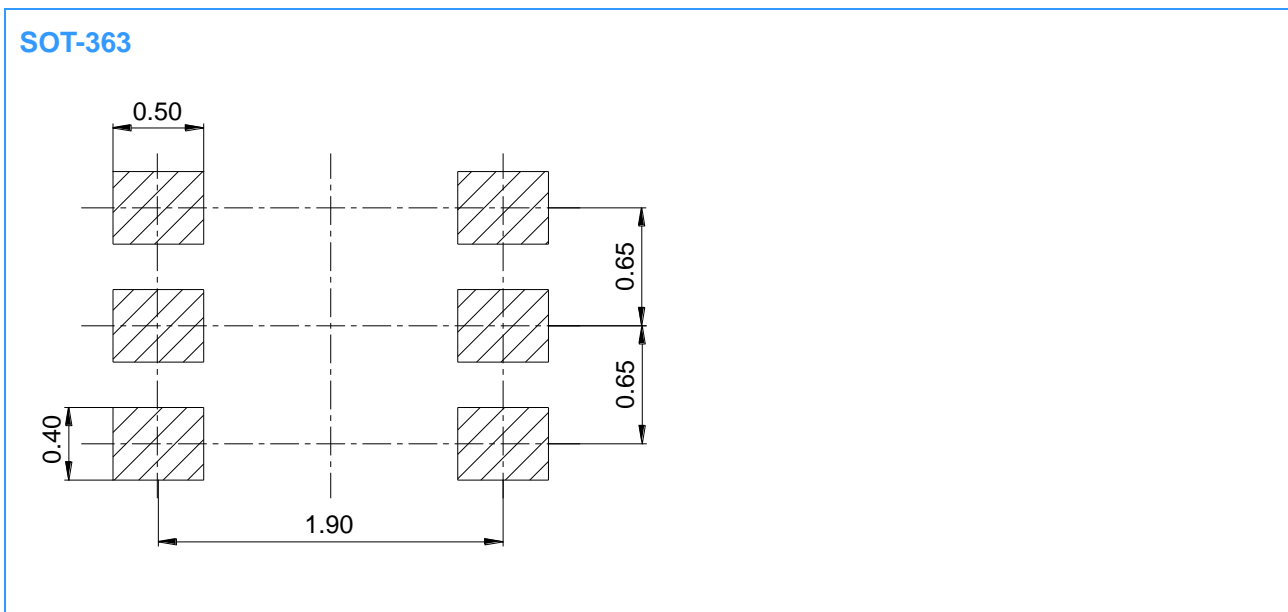


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)



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