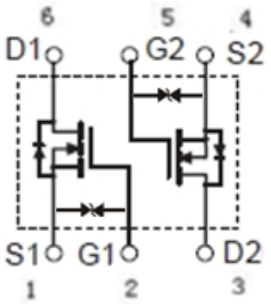
Dual N-Channel Enhancement Mode MOSFET

TBL1012DW

Features

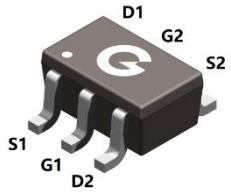
HF

- N-Channel switch with low $R_{DS(on)}$
- Operated at low logic level gate drive
- HBM: AEC-Q101-001: H2 (JESD22-A114-B: 2)
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards



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
TBL1012DW	SOT-363	3000 pcs / Tape & Reel	1012

Maximum Ratings (@ T_A = 25℃ 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	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Electrical Characteristics (@ 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	20	-	-	V
I_{DSS}	Drain to Source Leakage Current	V_{DS} = 20V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Gate-body Leakage	V_{GS} = ±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 = 250μA	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	-	pF
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 = 1Ω	-	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 I_D = 0.5A V_{GS} = 4.5V	-	2.35	-	nC
Q_{GS}	Gate-Source Charge		-	0.22	-	
Q_{GD}	Gate-Drain Charge		-	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 ≤ 10 sec

2、 Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

3、 Guaranteed by design, not subject to production

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

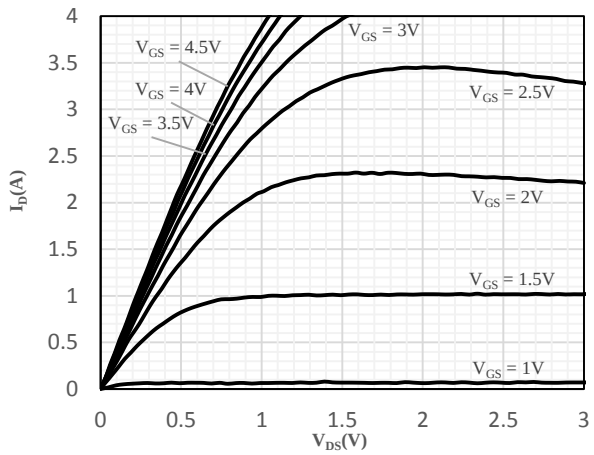


Fig 1 Typical Output Characteristics

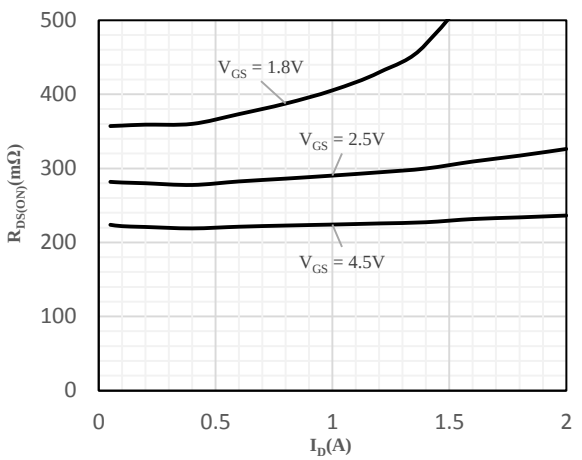


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

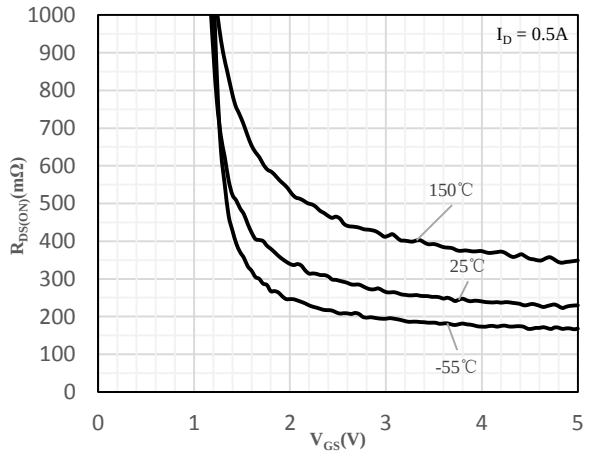


Fig 3 On-Resistance vs. Gate-Source Voltage

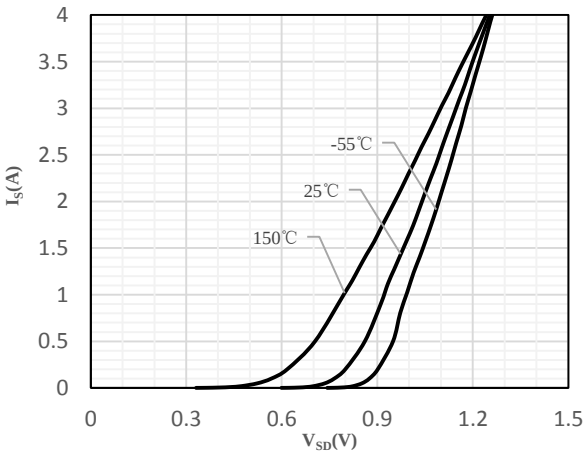


Fig 4 Body-Diode Characteristics

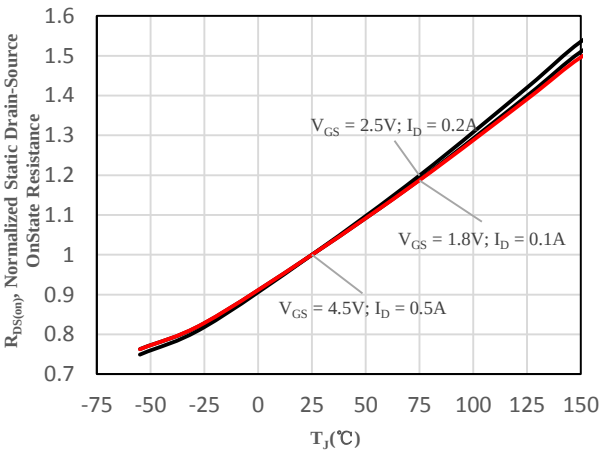


Fig 5 Normalized On-Resistance vs. Junction Temperature

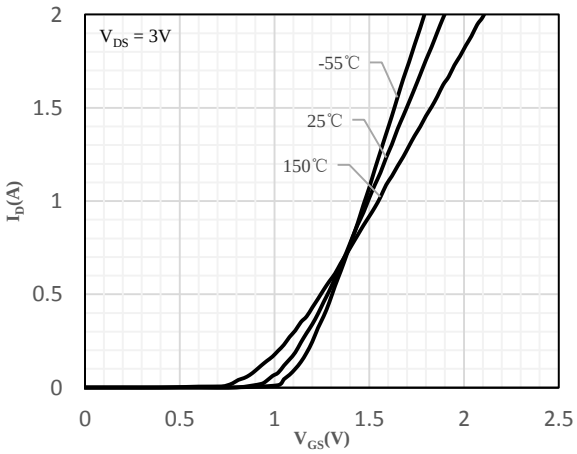


Fig 6 Transfer Characteristics

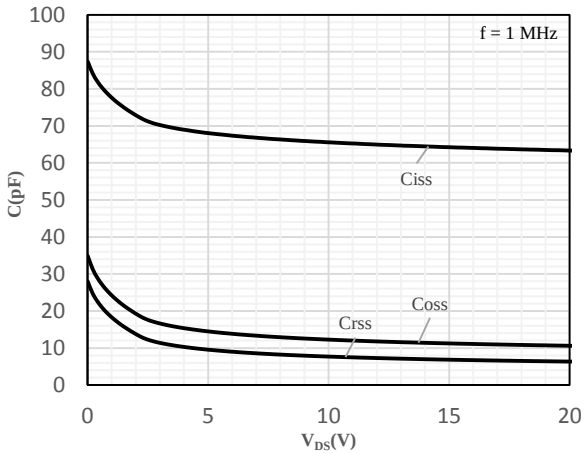


Fig 7 Capacitance Characteristics

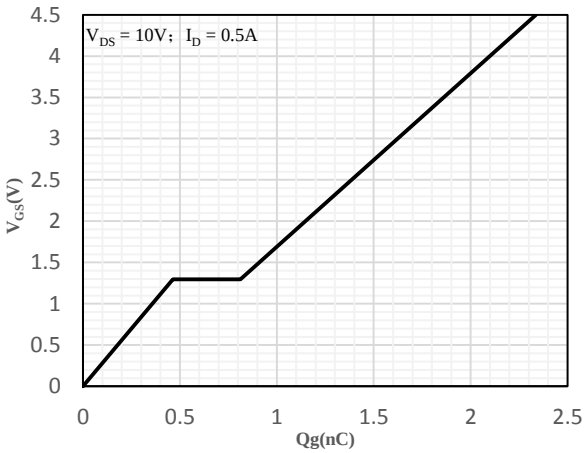


Fig 8 Gate-Charge Characteristics

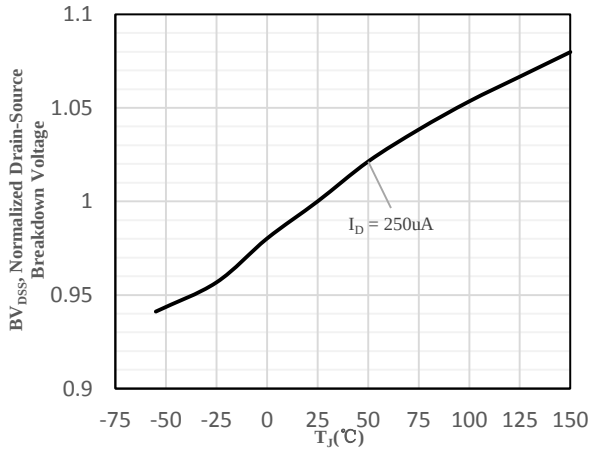


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

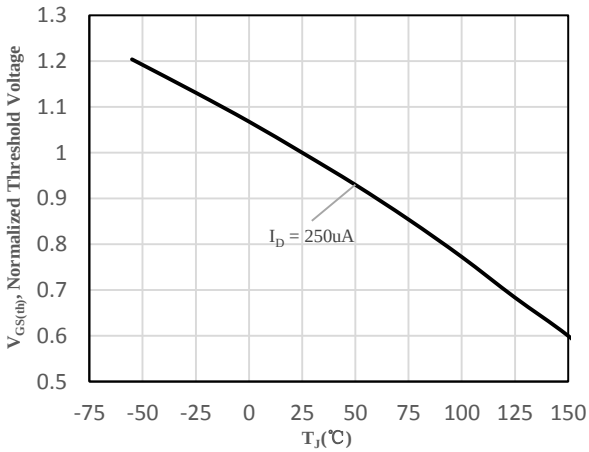
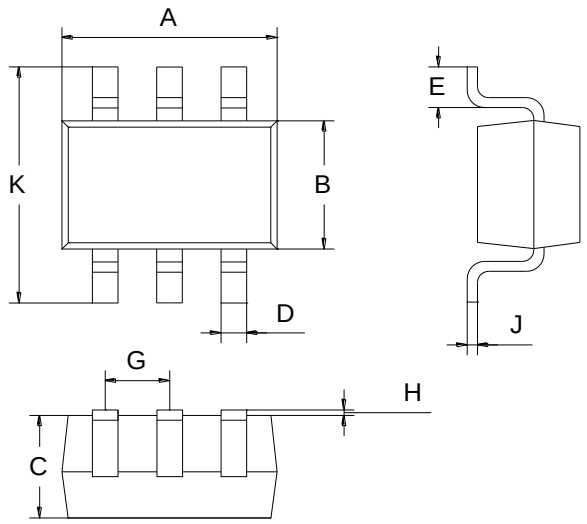


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

Package Outline Dimensions (Unit: mm)



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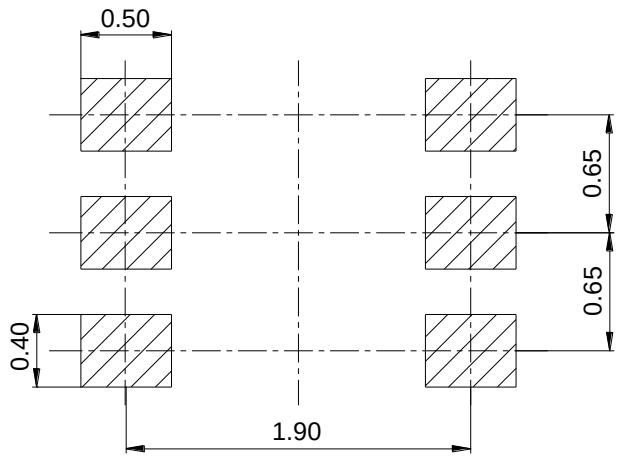
Dimension	**Min.**	**Max.**
A	2.00	2.20
B	1.15	1.35
C	0.85	1.05
D	0.15	0.35
E	0.25	0.40
G	0.60	0.70
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40

Mounting Pad Layout (Unit: mm)

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