

Features

- Low gate charge
- High performance trench technology for extremely low $R_{DS(ON)}$
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

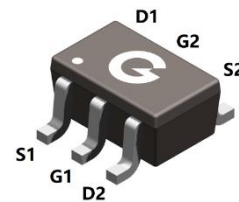
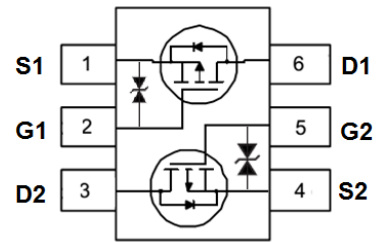
HF

Typical Applications

- DC-DC Converters
- Power management functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc

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
TBL6306P	SOT-363	3000 pcs / Tape & Reel	06

Maximum Ratings (@ $T_A = 25^\circ\text{C}$ 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	I_D	-0.6	A
Pulsed Drain Current	I_{DM}	-2	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation	P_D	0.3	W
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	477	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	232	$^\circ\text{C/W}$
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 = -250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -16V, V _{GS} = 0V	-	-	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±4.5V, V _{DS} = 0V	-	-	±10	μA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = -4.5V, I _D = -0.78A	-	305	480	mΩ
		V _{GS} = -2.5V, I _D = -0.66A	-	390	670	mΩ
		V _{GS} = -1.8V, I _D = -0.1A	-	540	950	mΩ
		V _{GS} = -1.5V, I _D = -0.1A	-	830	2200	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-0.45	-0.82	-1.2	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	448	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V	-	127	-	pF
C _{OSS}	Output Capacitance	V _{DS} = -16V	-	21	-	
C _{RSS}	Reverse Transfer Capacitance	f = 1.0MHz	-	10	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V, V _{GS} = -5V R _G = 10Ω, R _L = 50Ω I _D = -0.2A	-	51.3	-	ns
t _r	Turn-on Rise Time		-	24.2	-	
t _{d(OFF)}	Turn-Off Delay Time		-	246	-	
t _f	Turn-Off Fall Time		-	81.2	-	
Q _G	Total Gate-Charge	V _{DD} = -16V	-	3	-	nC
Q _{GS}	Gate to Source Charge	V _{GS} = -4.5V	-	0.6	-	
Q _{GD}	Gate to Drain (Miller) Charge	I _D = -0.2A	-	0.7	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _{SD} = -0.35A, V _{GS} = 0V	-	-0.87	-1.2	V

Notes:

- Surface Mounted on 1 inch² FR-4 board with 2OZ copper
- Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

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

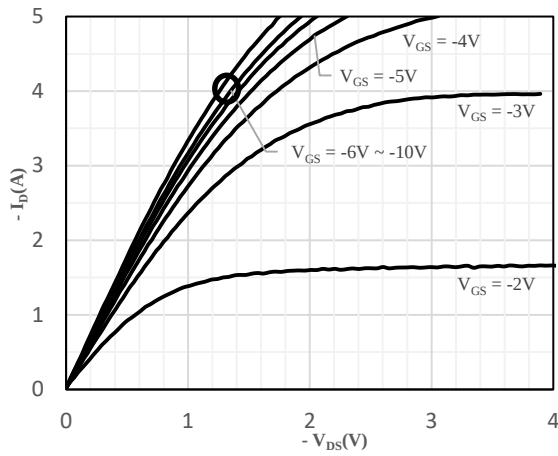


Fig 1 Typical Output Characteristics

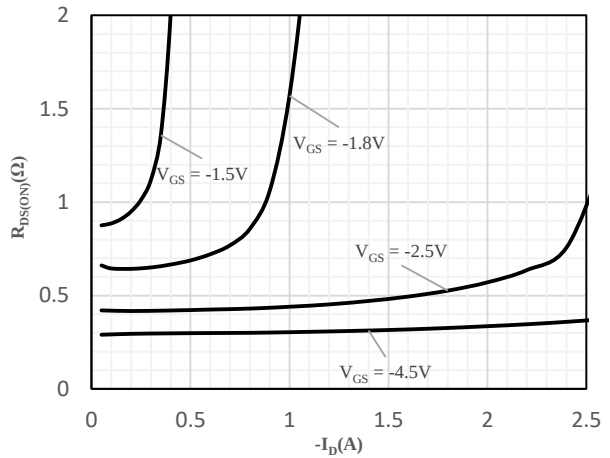


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

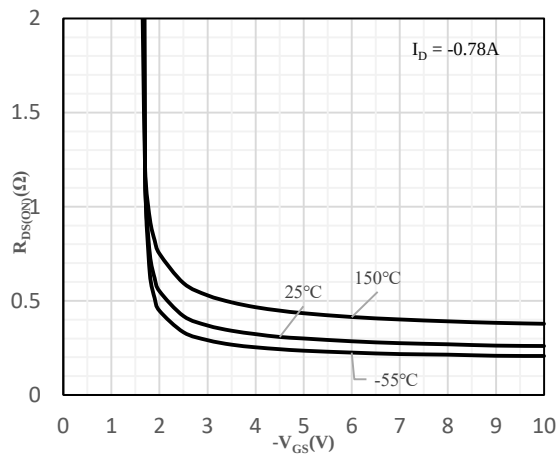


Fig 3 On-Resistance vs. Gate-Source Voltage

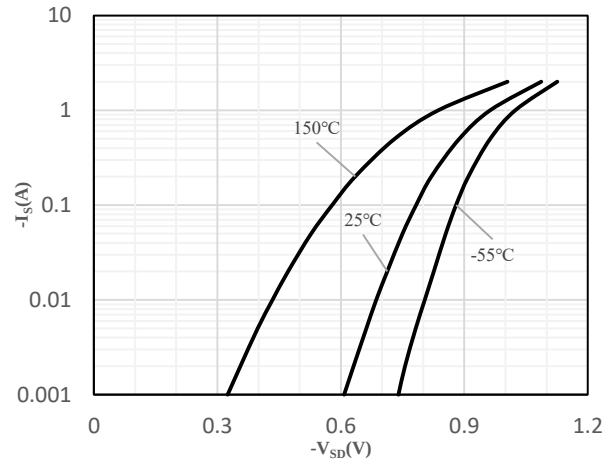


Fig 4 Body-Diode Characteristics

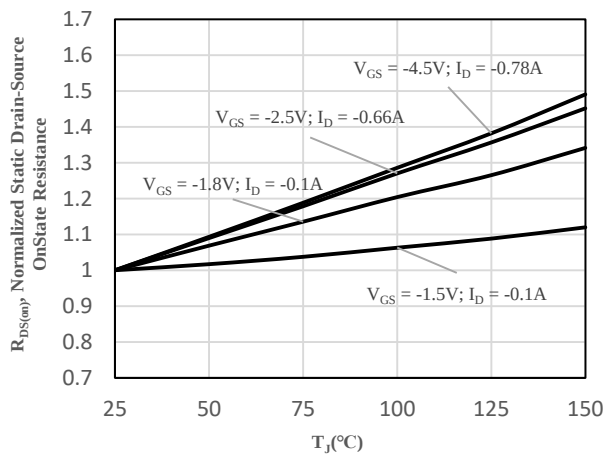


Fig 5 Normalized On-Resistance vs. Junction Temperature

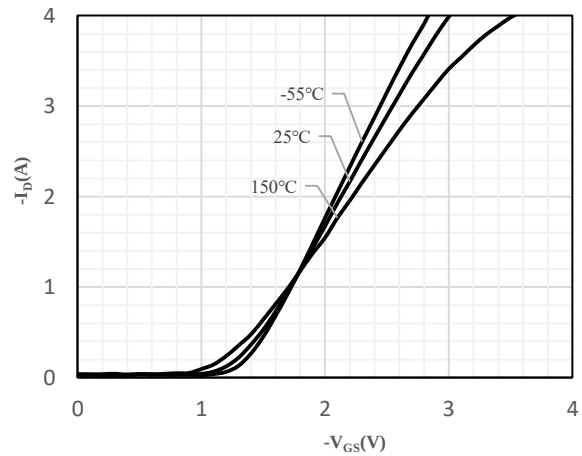


Fig 6 Transfer Characteristics

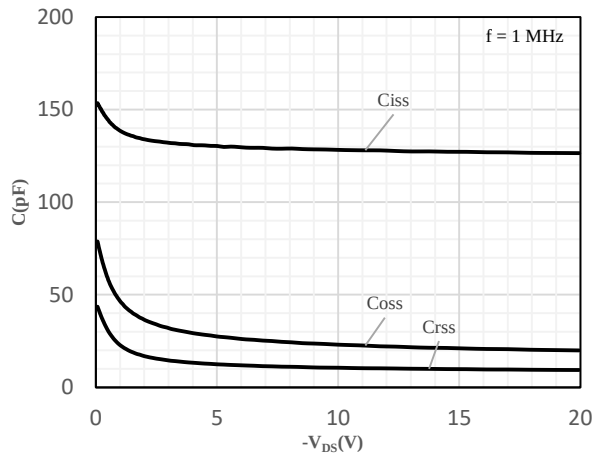


Fig 7 Capacitance Characteristics

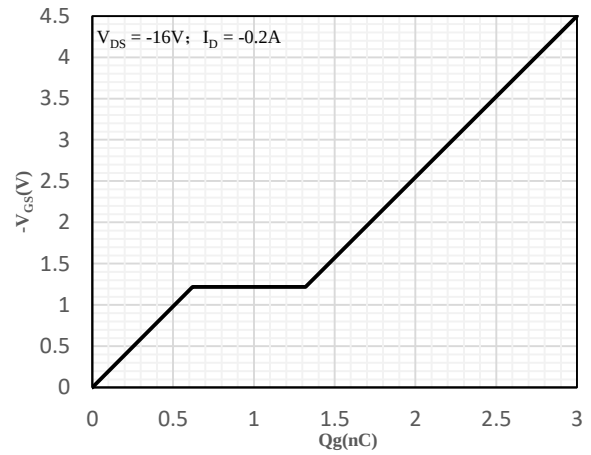


Fig 8 Gate-Charge Characteristics

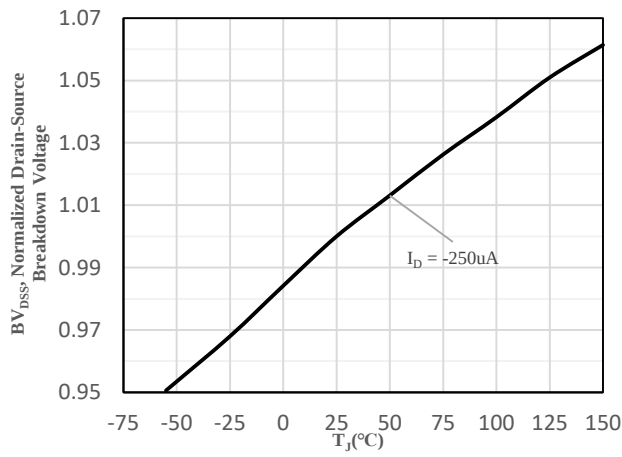


Fig 9 Normalized Breakdown Voltage
vs. Junction Temperature

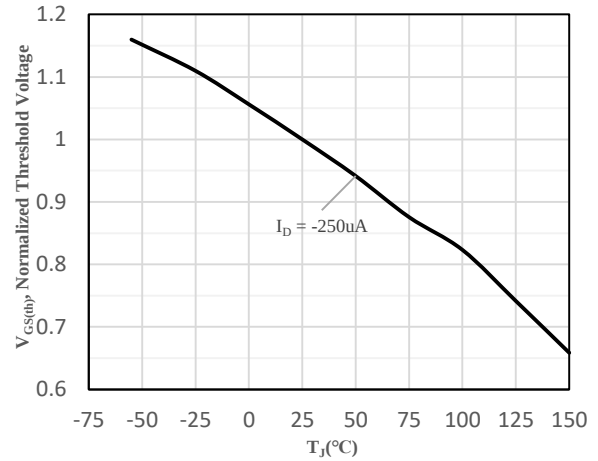


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

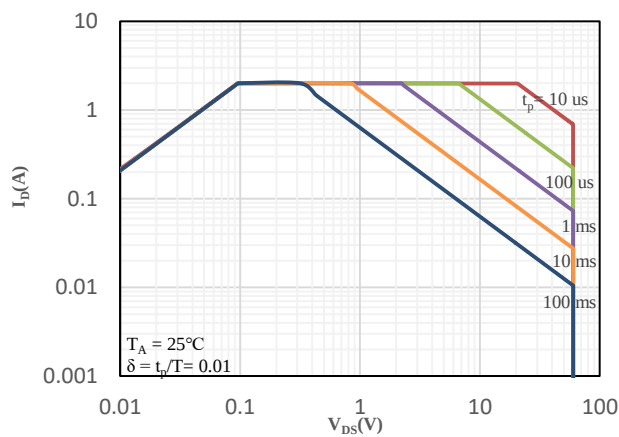


Fig 11 Safe Operation Area

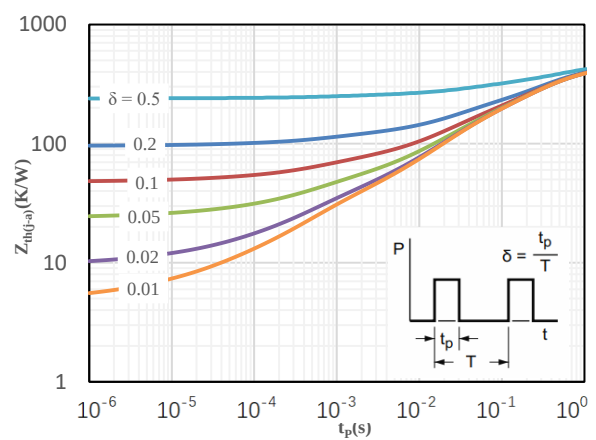
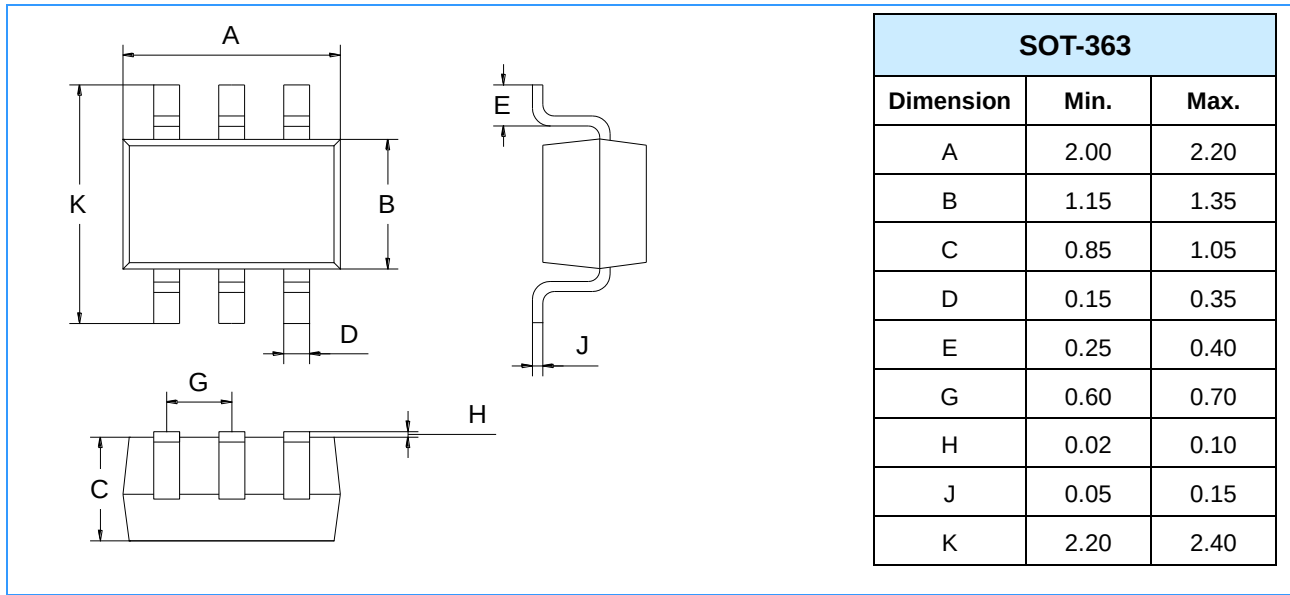
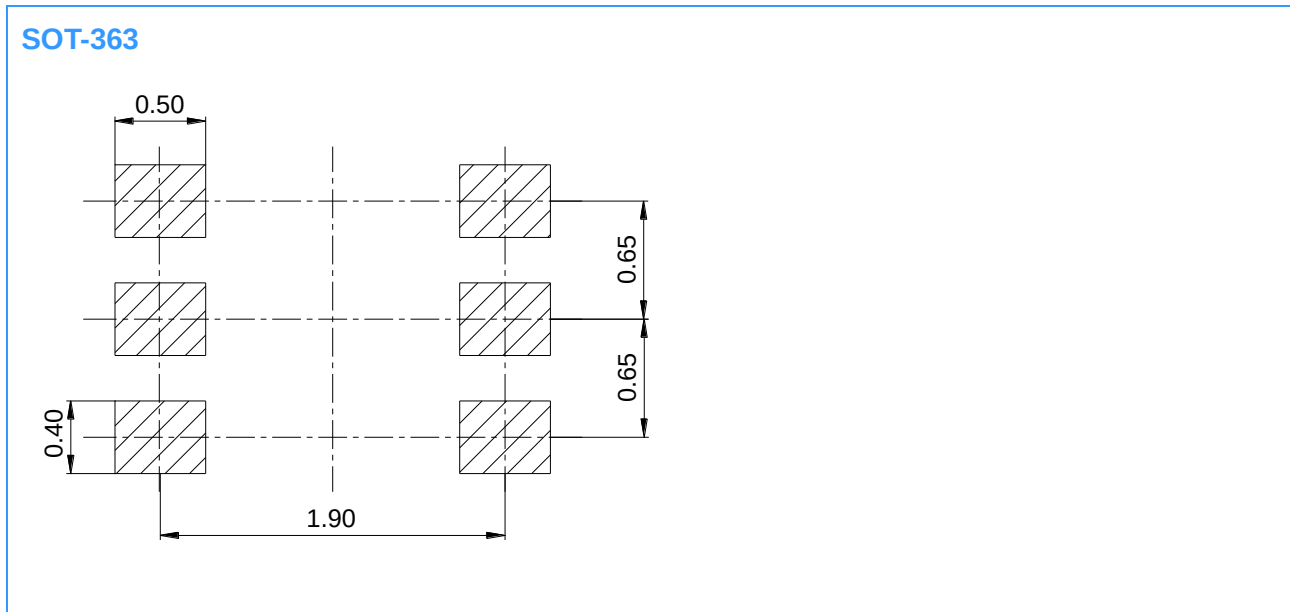


Fig 12 Maximum transient thermal impedance

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)



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