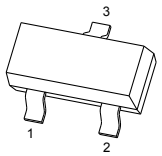
SOT-23 Plastic-Encapsulate MOSFETS

TF2305B

TF2305B P-Channel 16-V(D-S) MOSFET

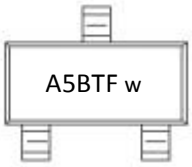
$V_{(BR)DSS}$	$R_{DS(on)}$MAX	I_D
-16V	0.060Ω@-4.5V	-4.0A
	0.080Ω@-2.5V	

SOT-23



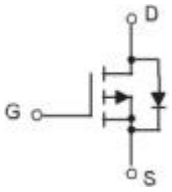
1.GATE
2.SOURCE
3.DRAIN

MARKING



*w：week code

Equivalent Circuit



General FEATURE

- TrenchFET Power MOSFET
- Lead free product is acquired
- Surface mount package

APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

Maximum ratings (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-16	V
Gate-Source Voltage	V_{GS}	±12	
Continuous Drain Current	I_D	-4.0	A
Pulsed Drain Current	I_{DM}	-15	
Continuous Source-Drain Diode Current	I_S	-1.4	
Maximum Power Dissipation	P_D	1	W
Thermal Resistance from Junction to Ambient(t ≤5s)	$R_{\theta JA}$	125	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{stg}	-55 ~+150	

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MOSFET ELECTRICAL CHARACTERISTICS

T_a =25 ℃ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-16			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.5	-0.7	-1	
Gate-source leakage	I_{GSS}	V_{DS} =0V, V_{GS} =±10V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} =-15V, V_{GS} =0V			-1	μA
Drain-source on-state resistance [a]	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-4.0A		0.045	0.050	Ω
		V_{GS} =-2.5V, I_D =-3.0A		0.075	0.080	
Forward transconductance [a]	g_{fs}	V_{DS} =-5V, I_D =-2.0A	5.0			S
Dynamic[b]						
Input capacitance	C_{iss}	V_{DS} =-10V,V_{GS} =0V,f =1MHz		405		pF
Output capacitance	C_{oss}			112		
Reverse transfer capacitance	C_{rss}			89		
Total gate charge	Q_g	V_{DS} =-10V,V_{GS} =-4.5V,I_D =-2.5A		9.0		nC
Gate-source charge	Q_{gs}			1.0		
Gate-drain charge	Q_{gd}			2.5		
Gate resistance	R_g	f =1MHz		7.0		Ω
Turn-on delay time	$t_{d(on)}$	V_{DD}=-10V, R_L=2.9Ω, V_{GEN}=-4.5V,Rg=10Ω		11.0		ns
Rise time	t_r			35.0		
Turn-off delay time	$t_{d(off)}$			30.0		
Fall time	t_f			10.0		
Drain-source body diode characteristics						
Continuous source-drain diode current	I_S	T_C=25℃			-1.4	A
Pulse diode forward current [a]	I_{SM}				-10	
Body diode voltage	V_{SD}	I_S=-3.0A		-0.8	-1.2	V

Notes :

a.Pulse Test : Pulse Width < 300μs, Duty Cycle ≤2%.

b.Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

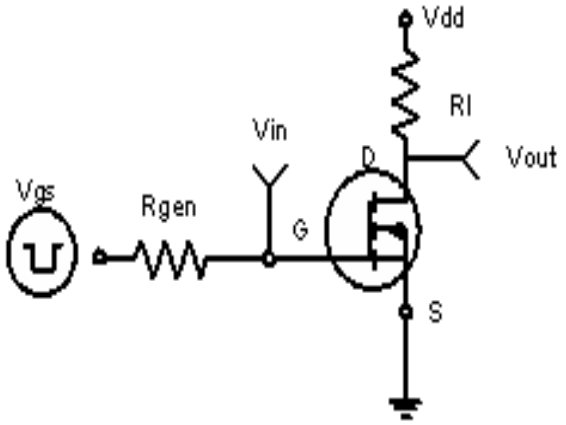

Figure 1:Switching Test Circuit

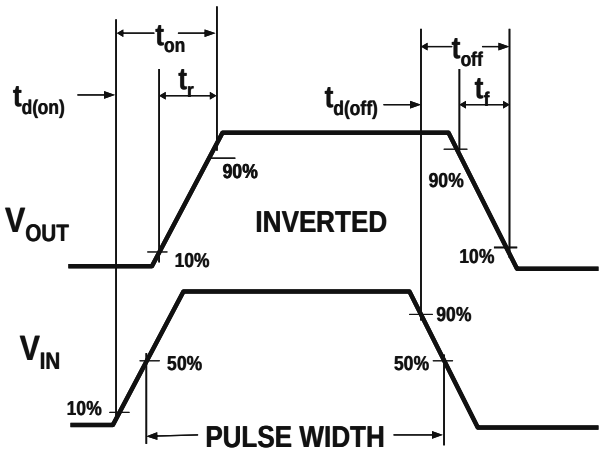

Figure 2:Switching Waveforms

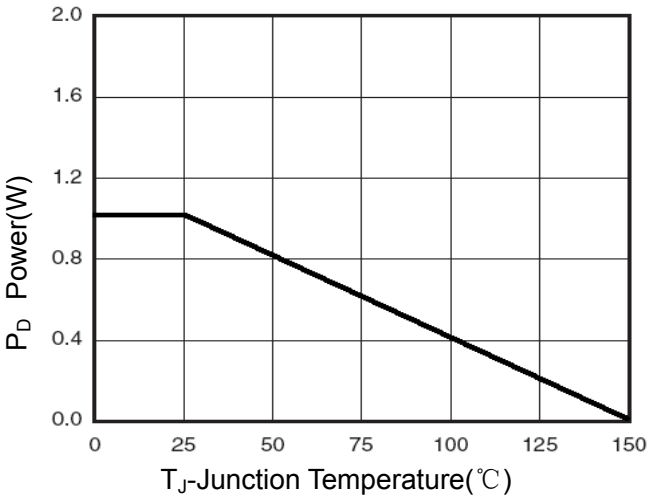

Figure 3 Power Dissipation

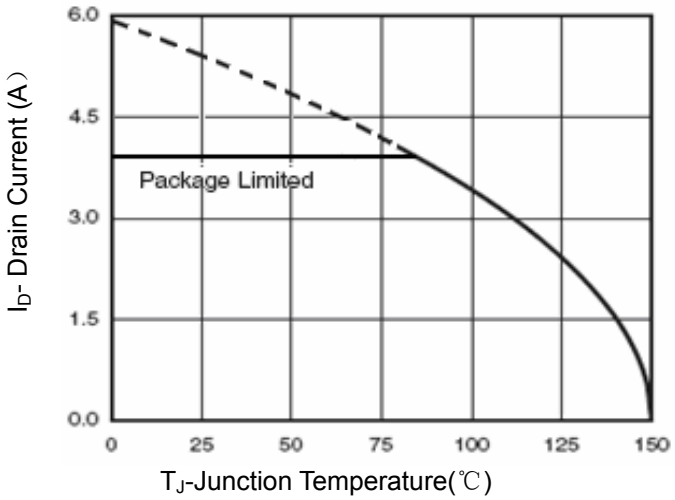

Figure 4 Drain Current

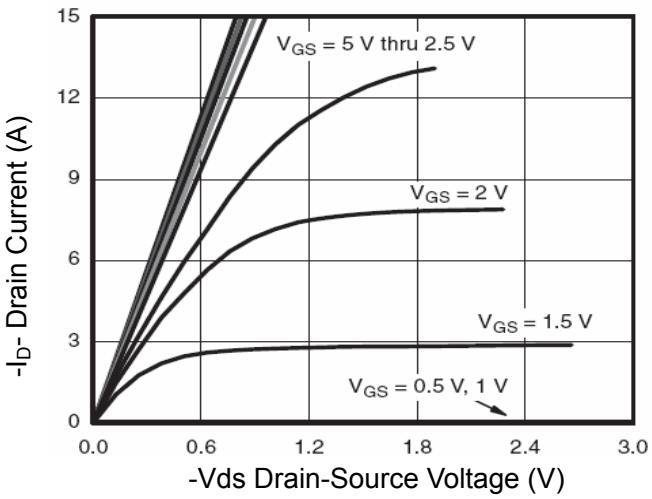

Figure 5 Output Characteristics

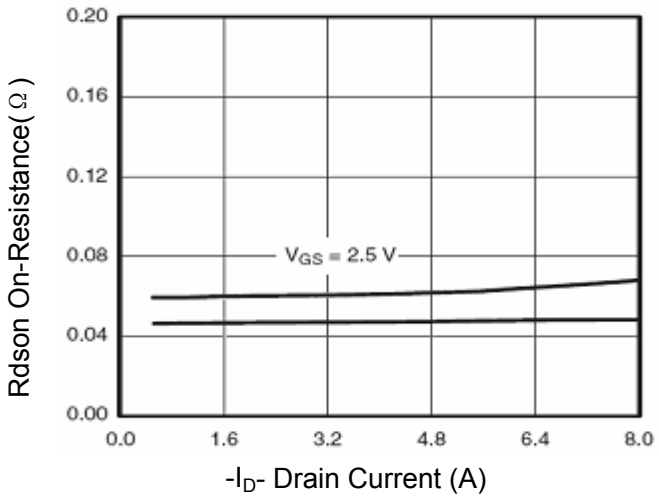

Figure 6 Drain-Source On-Resistance

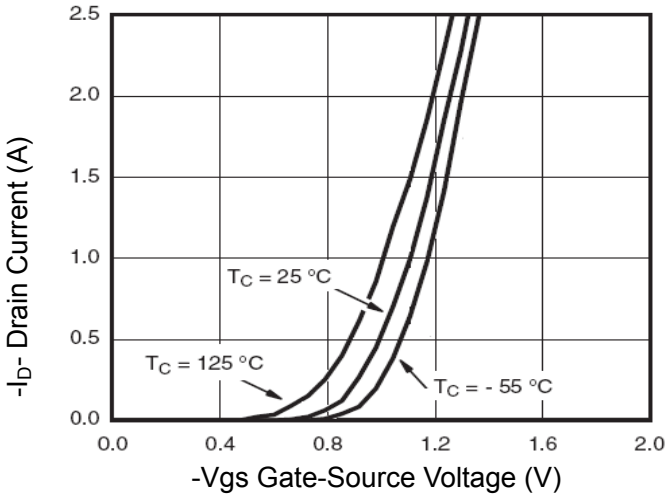

Figure 7 Transfer Characteristics

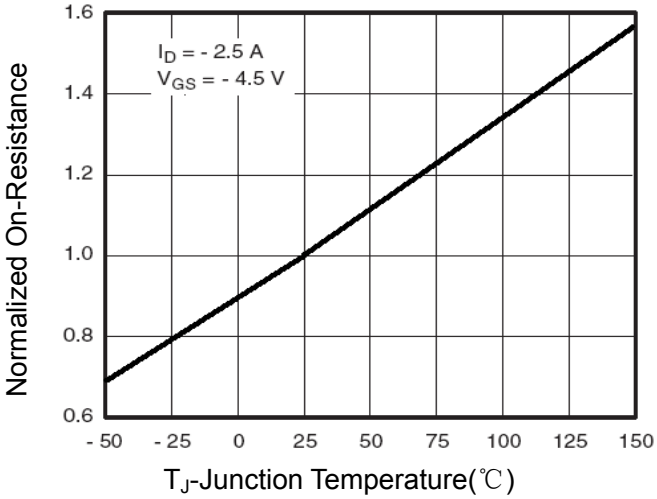

Figure 8 Drain-Source On-Resistance

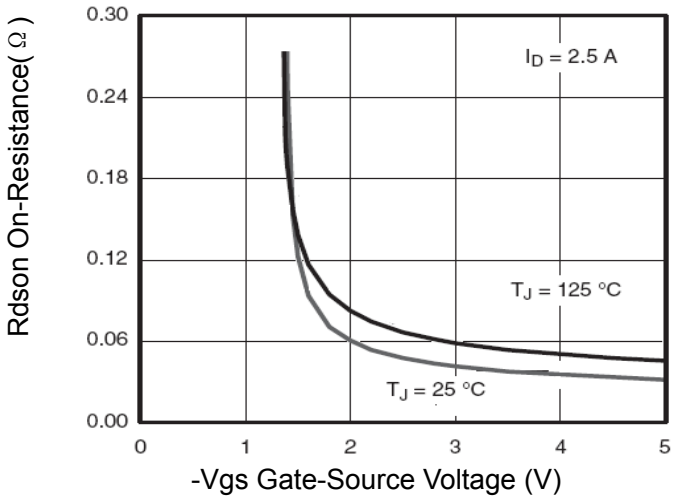

Figure 9 Rdson vs Vgs

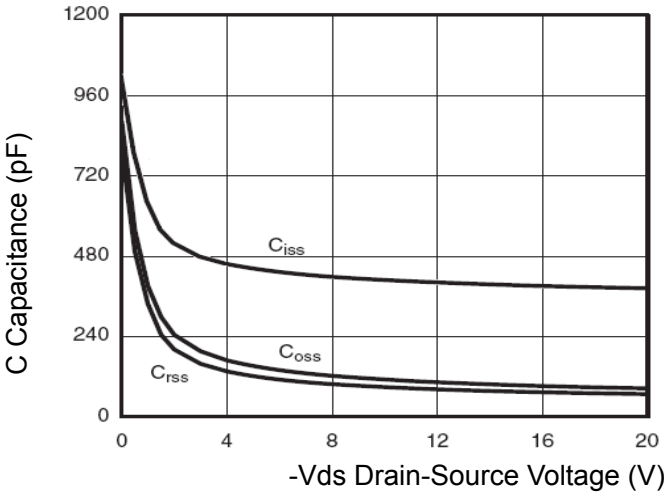

Figure 10 Capacitance vs Vds

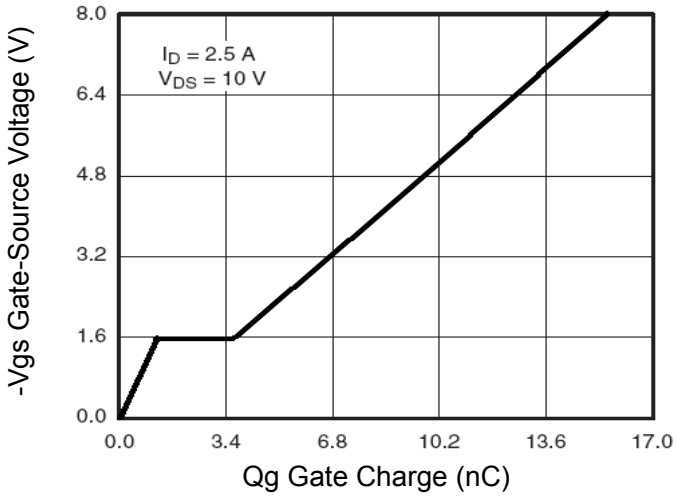

Figure 11 Gate Charge

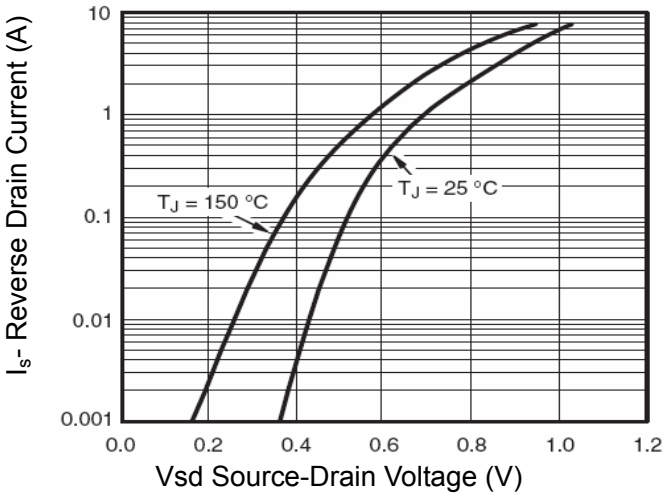

Figure 12 Source- Drain Diode Forward

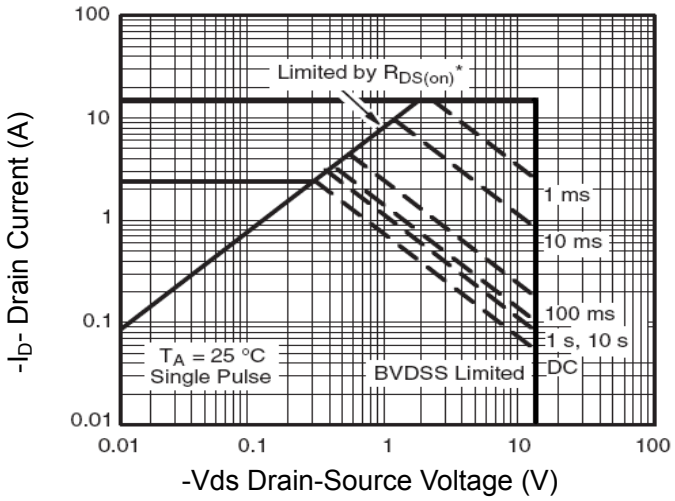

Figure 13 Safe Operation Area

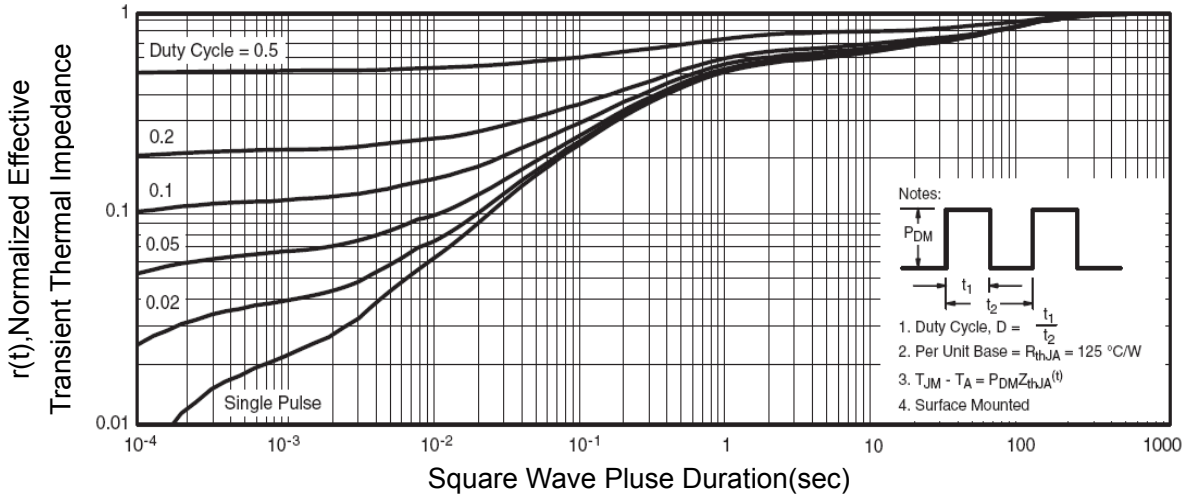

Figure 14 Normalized Maximum Transient Thermal Impedance

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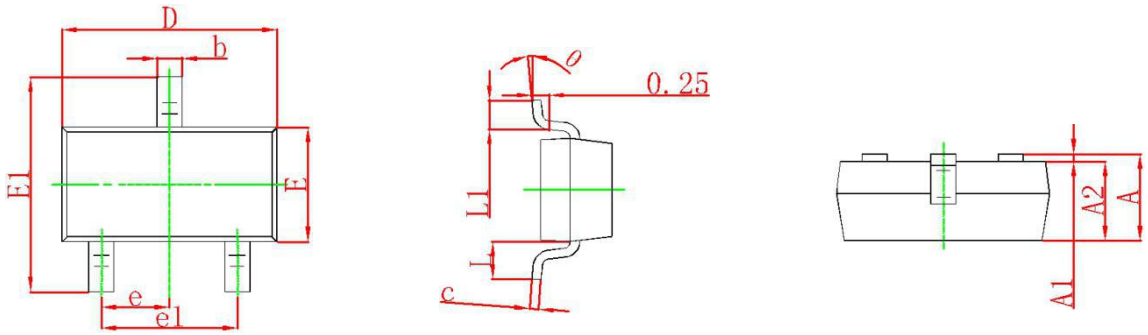
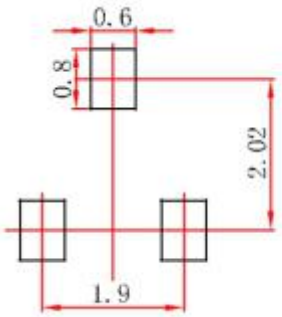
SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.