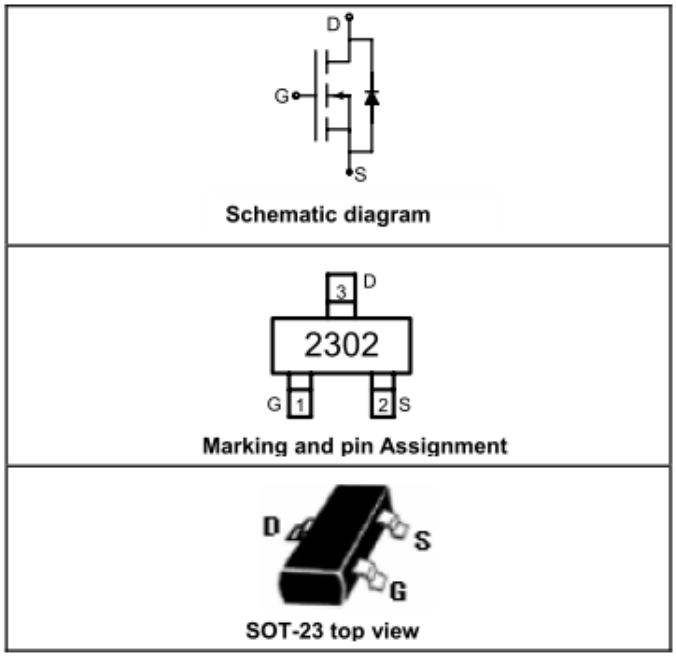
20V、2.4A N-Channel MOSFET

Description

The EC732302 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.



Features and Benefits:

- V_{DS} = 20V,I_D =2.4A
  $R_{DS(ON)}$ <115mΩ @ V_{GS}=2.5V
  $R_{DS(ON)}$ < 60mΩ @ V_{GS}=4.5V
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

- Battery protection
- Load switch
- Power management

Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	VDS	20	V
Gate-Source Voltage	VGS	±8	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	ID (25℃)	2.4	A
	ID (70℃)	1.7	A
	IDM	10	A
Maximum Power Dissipation	PD	0.9	W
Operating Junction and Storage Temperature Range	TJ,TSTG	-55 To 150	℃

Thermal Resistance

Thermal Resistance, Junction-Ambient (Note 2)	$R_{\theta JA}$	140	℃/W

Electrical Characteristics (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±8V,V_{DS}=0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.65	0.95	1.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=2.5V, I_D=3.1A		70	115	mΩ
		V_{GS}=4.5V, I_D=3.6A		45	60	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=3.6A		8		S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{lss}	V_{DS}=10V,V_{GS}=0V, F=1.0MHz		300		PF
Output Capacitance	C_{oss}			120		PF
Reverse Transfer Capacitance	C_{rss}			80		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V, R_L = 2.8 Ω V_{GS}=4.5V,R_{GEN}=6Ω, I_D=3.6A,		7	15	nS
Turn-on Rise Time	t_r			55	80	nS
Turn-Off Delay Time	$t_{d(off)}$			16	60	nS
Turn-Off Fall Time	t_f			10	25	nS
Total Gate Charge	Q_g	V_{DS}=10V,I_D=3.6A,V_{GS}=4.5V		4.0	10	nC
Gate-Source Charge	Q_{gs}			0.65		nC
Gate-Drain Charge	Q_{gd}			1.5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=0.94A		0.76	1.2	V
Diode Forward Current (Note 2)	I_S			0.94		A

NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on 1in2 FR4 Board, t ≤ 10 sec.

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

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

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Typical electrical and thermal characteristics

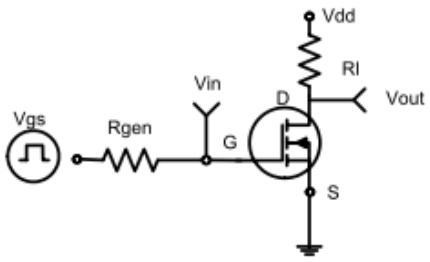


Figure 1:Switching Test Circuit

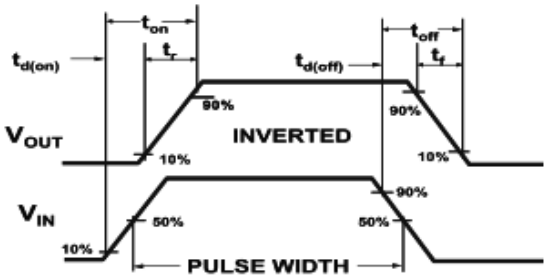


Figure 2:Switching Waveforms

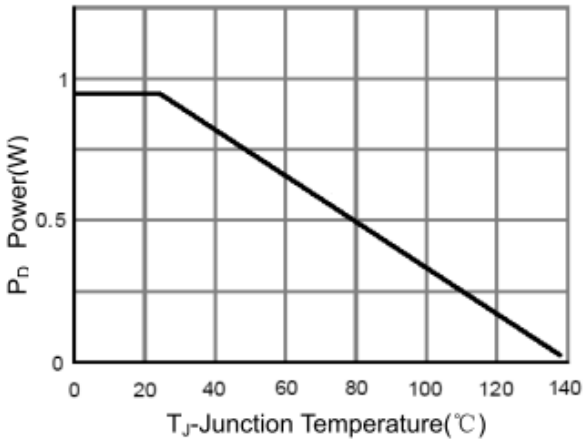


Figure 3 Power Dissipation

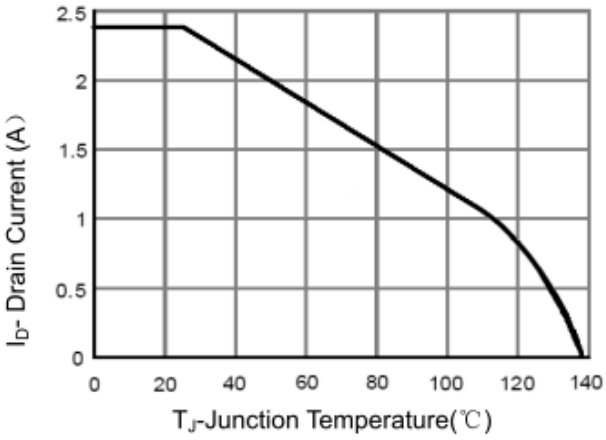


Figure 4 Drain Current

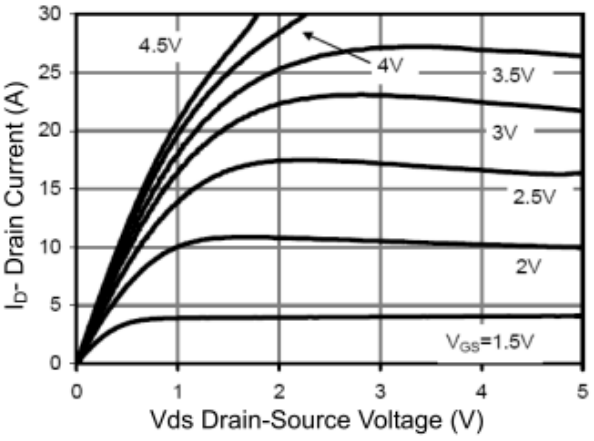


Figure 5 Output CHARACTERISTICS

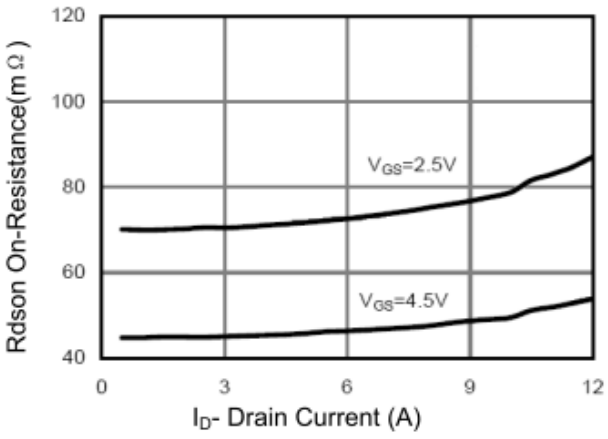


Figure 6 Drain-Source On-Resistance

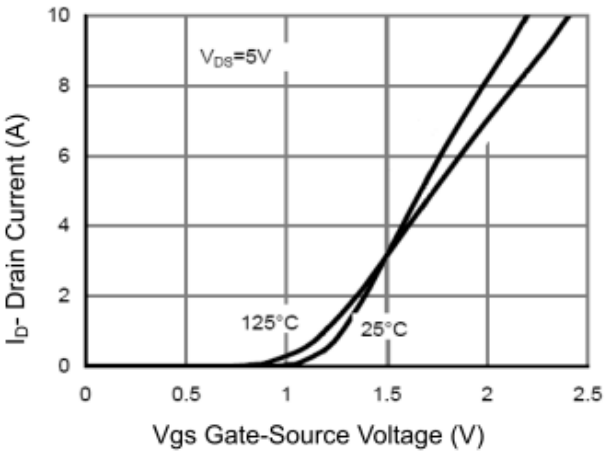


Figure 7 Transfer Characteristics

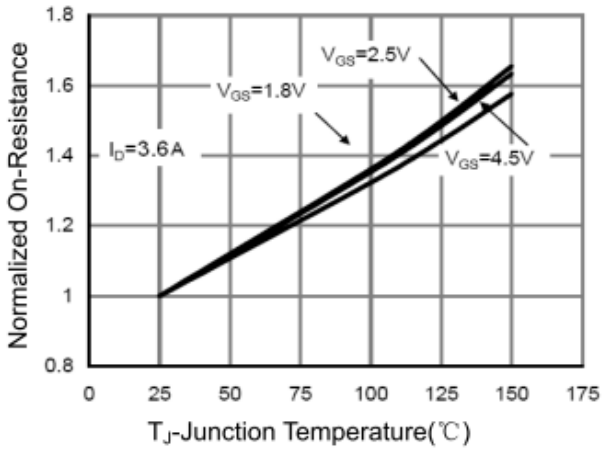


Figure 8 Drain-Source On-Resistance

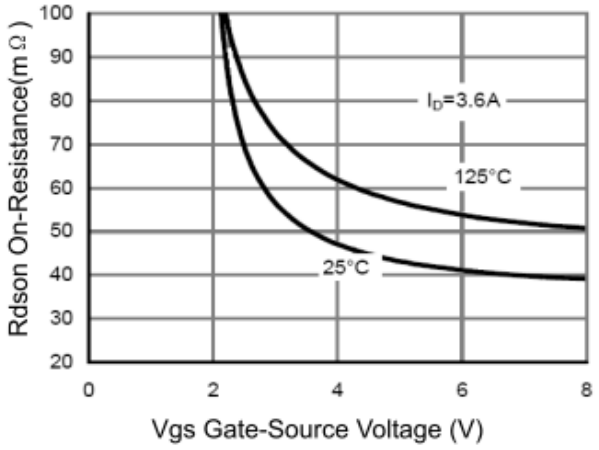


Figure 9 Rdson vs Vgs

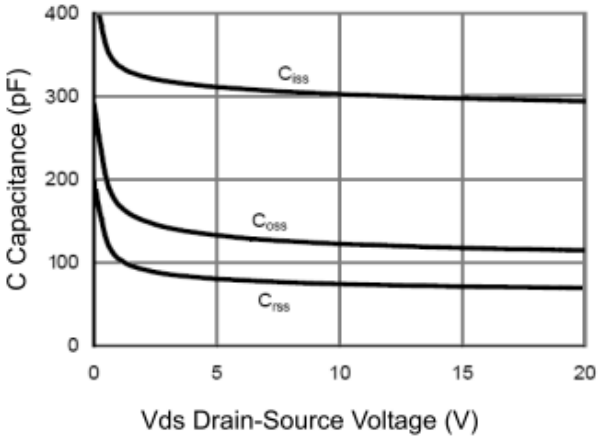


Figure 10 Capacitance vs Vds

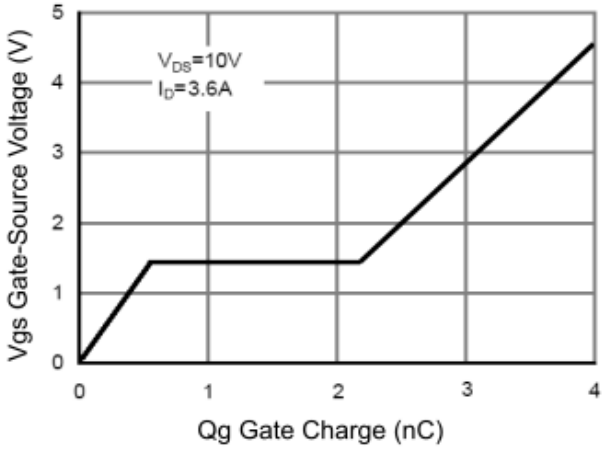


Figure 11 Gate Charge

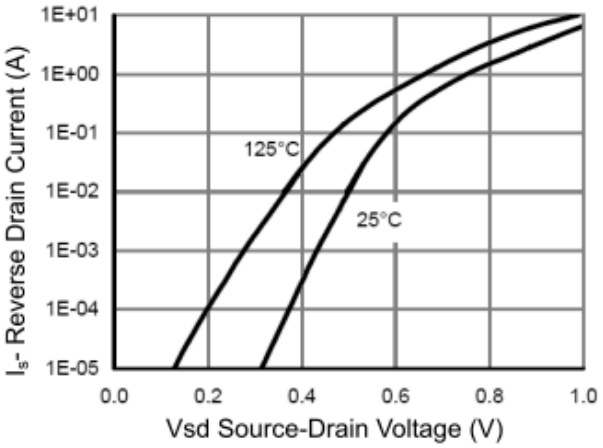


Figure 12 Source- Drain Diode Forward

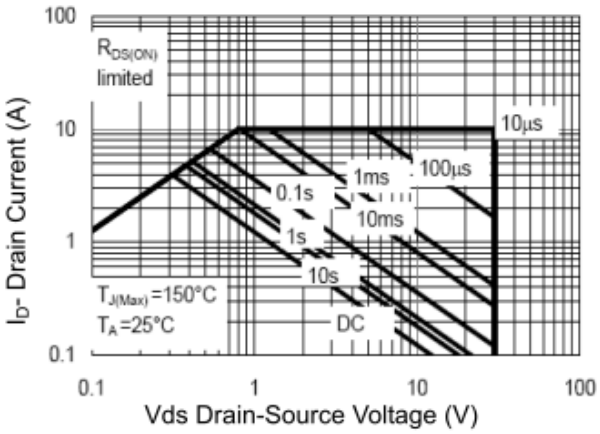


Figure 13 Safe Operation Area

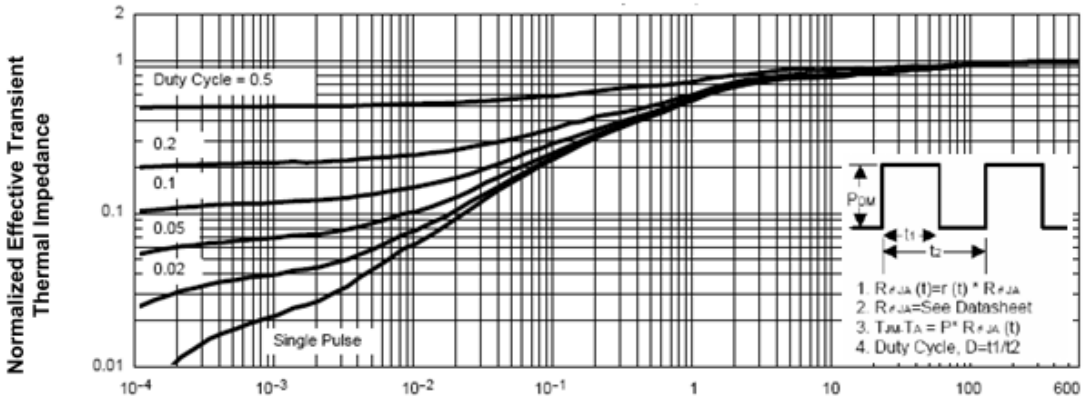


Figure 14 Normalized Maximum Transient Thermal Impedance

Ordering and Marking Information

EC732302 XX X

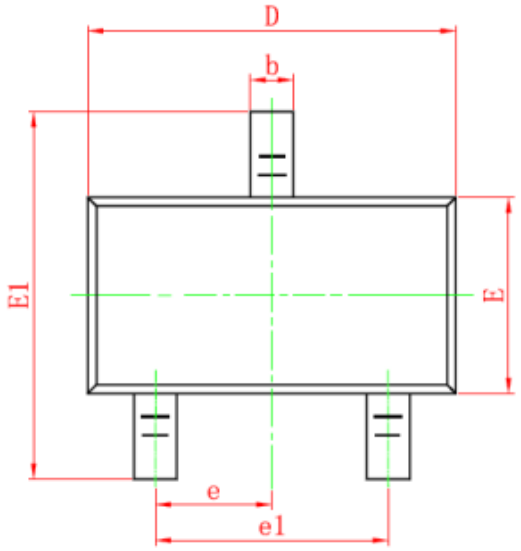
R：Tape & Reel

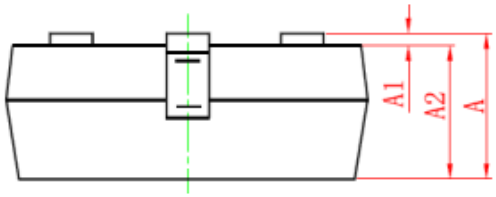
B1＝SOT23-3L

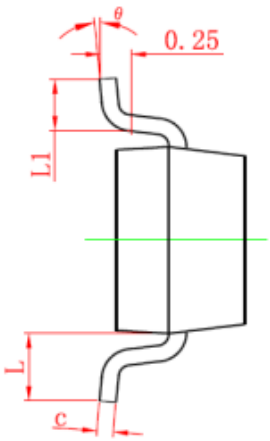
Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
2302	EC732302B1R	SOT23-3L	Ø180mm	8 mm	3000 units

SOT23-3L Package Outline Dimension

Dimensions in Millimeters (UNIT:mm)







Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

NOTES

1. All dimensions are in millimeters.
2. Tolerance ±0.10mm (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.