



ER3401B

-30V P-Channel MOSFET

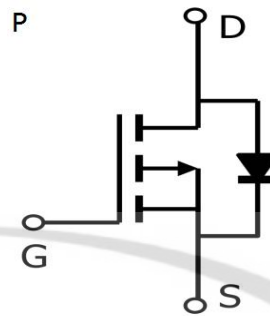
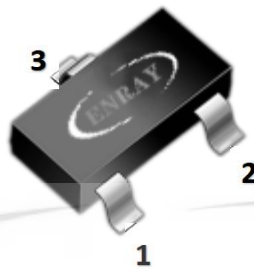
Features

- Trench FET Power MOSFET
- High Speed Switching

Product Summary

V _{DS}	-30V
I _D	-4.1A
R _{DS(ON)} (at V _{GS} =-10V)	< 60mΩ
R _{DS(ON)} (at V _{GS} =-4.5V)	< 70mΩ
R _{DS(ON)} (at V _{GS} =-2.5V)	< 90mΩ

- 1.GATE
- 2.SOURCE
- 3.DRAIN



Order Information

Product	Package	Marking	Packing
ER3401B	SOT-23	A19T	3000PCS/Reel

Maximum Ratings(Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	-30	V
Gate-Source Voltage	V _{GS}	±12	
Continuous Drain Current	I _D	-4.1	A
Pulsed Drain Current ①	I _{DM}	-27	
Continuous Source-Drain Current(Diode Conduction)	I _S	-2	
Power Dissipation ②	P _D	1.4	W
Thermal Resistance from Junction to Ambient (t≤5s)	R _{θJA}	125	°C/W
Operating Junction	T _J	150	°C
Storage Temperature	T _{STG}	-55~+150	°C



Electrical Characteristics(T_J=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters ③						
Drain-Source Breakdown Voltage	B _V DSS	V _{GS} = 0V, I _D = -250μA	-30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.6	-0.95	-1.2	V
Gate-Body leakage Current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±12V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30V, V _{GS} = 0V			1	μA
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -4.1A		40	60	mΩ
		V _{GS} = -4.5V, I _D = -3.6A		45	70	mΩ
		V _{GS} = -2.5V, I _D = -2A		71	90	mΩ
Forward Transconductance	g _{Fs}	V _{DS} = -4.5V, I _D = -4.1A	7			S
Diode Forward Voltage	V _{SD}	I _S = -1A, V _{GS} = 0V		-0.7	-1.3	V
Dynamic Parameters ④						
Input Capacitance	C _{iss}	V _{DS} = -15V, V _{GS} = 0V, f = 1MHz		645		pF
Output Capacitance	C _{oss}			80		pF
Reverse Transfer Capacitance	C _{rss}			55		pF
Total Gate Charge	Q _g	V _{DS} = -15V, V _{GS} = -10V, I _D = -4.1A		14		nC
Gate Source Charge	Q _{gs}			1.5		nC
Gate Drain Charge	Q _{gd}			2.5		nC
Gate Resistance	R _g	f = 1MHz		8		Ω
Switching Parameters ④						
Turn-On Delay Time	t _{d(on)}	V _{DD} = -15V R _L = 4Ω, I _D ≈ -1A, V _{GEN} = -10V, R _g = 3Ω		6.3		ns
Turn-On Rise Time	t _r			3.2		ns
Turn-Off Delay Time	t _{d(off)}			41		ns
Turn-Off Fall Time	t _f			9		ns
Note :						
1. Repetitive Rating : Pulse width limited by maximum junction temperature.						
2. Surface Mounted on FR4 Board, t < 5 sec.						
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.						
4. Guaranteed by design, not subject to production testing.						

Typical Electrical and Thermal Characteristics

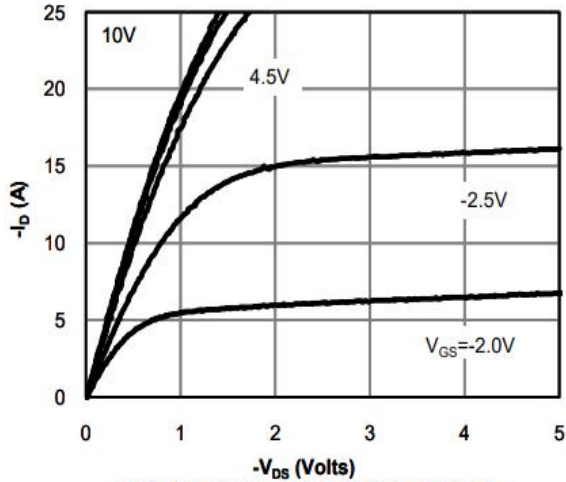


Fig 1: On-Region Characteristics (Note E)

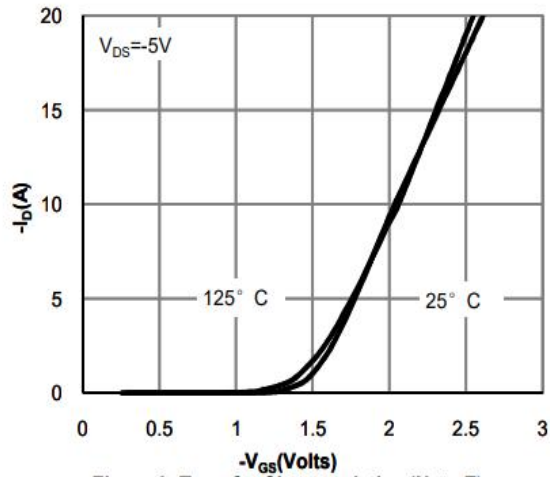


Figure 2: Transfer Characteristics (Note E)

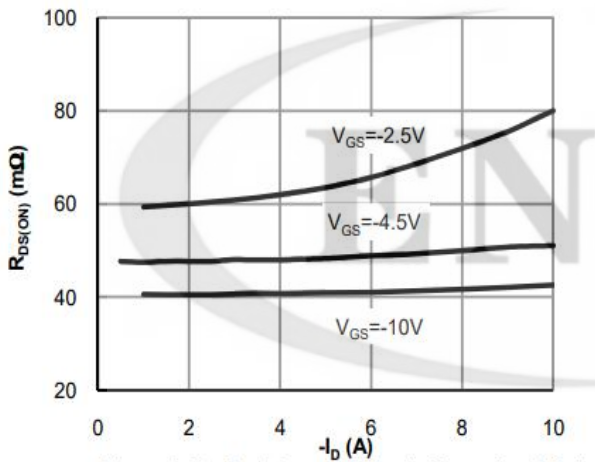


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

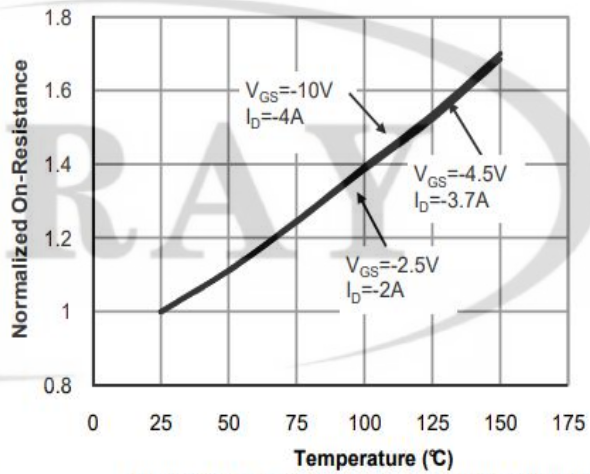


Figure 4: On-Resistance vs. Junction Temperature (Note E)

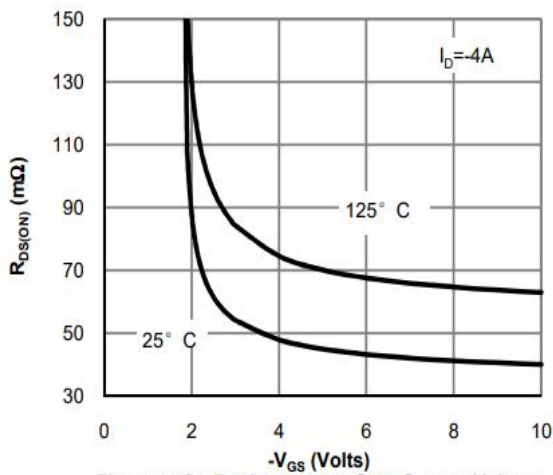


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

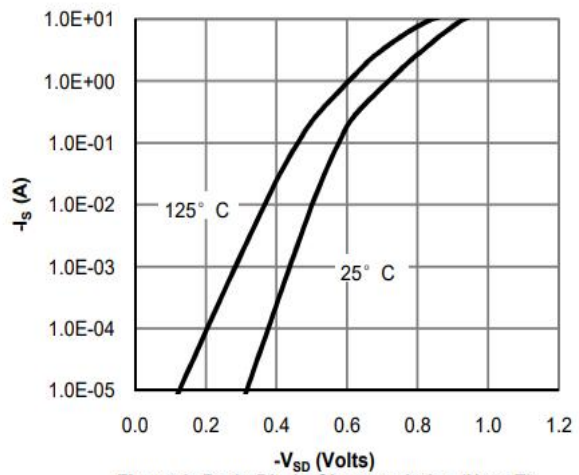


Figure 6: Body-Diode Characteristics (Note E)

Typical Electrical and Thermal Characteristics

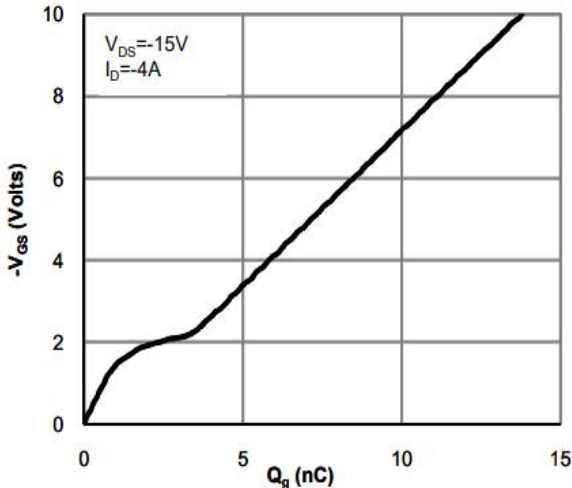


Figure 7: Gate-Charge Characteristics

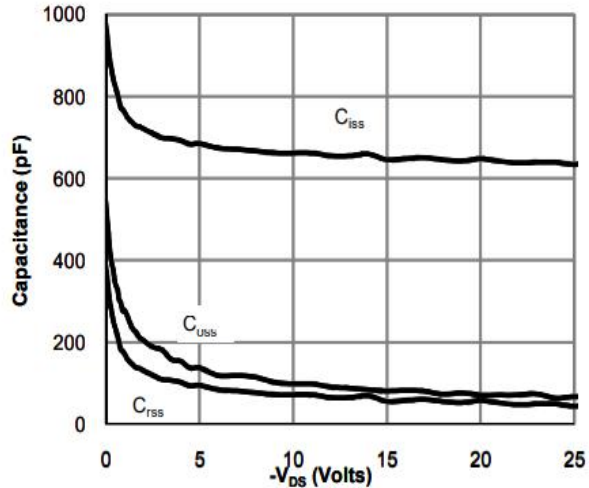


Figure 8: Capacitance Characteristics

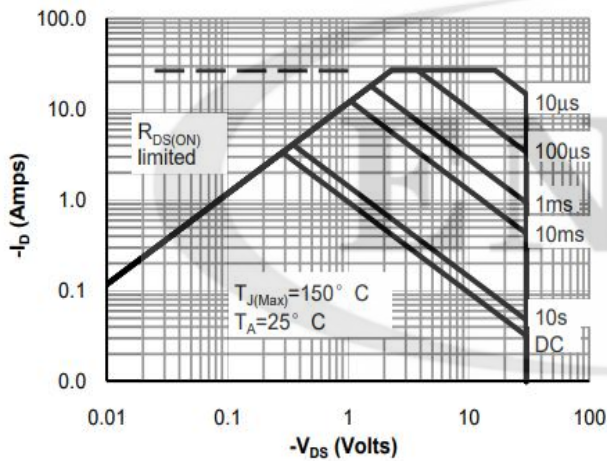


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

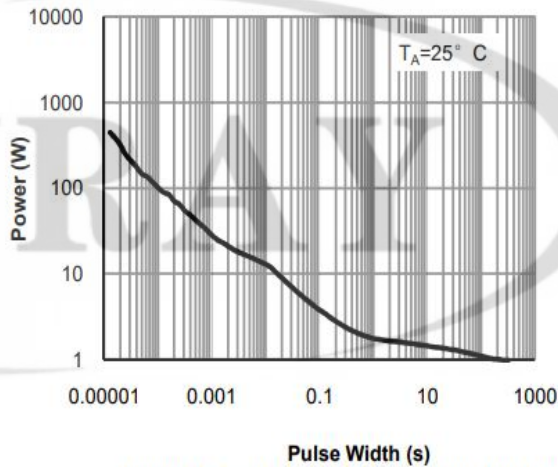


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

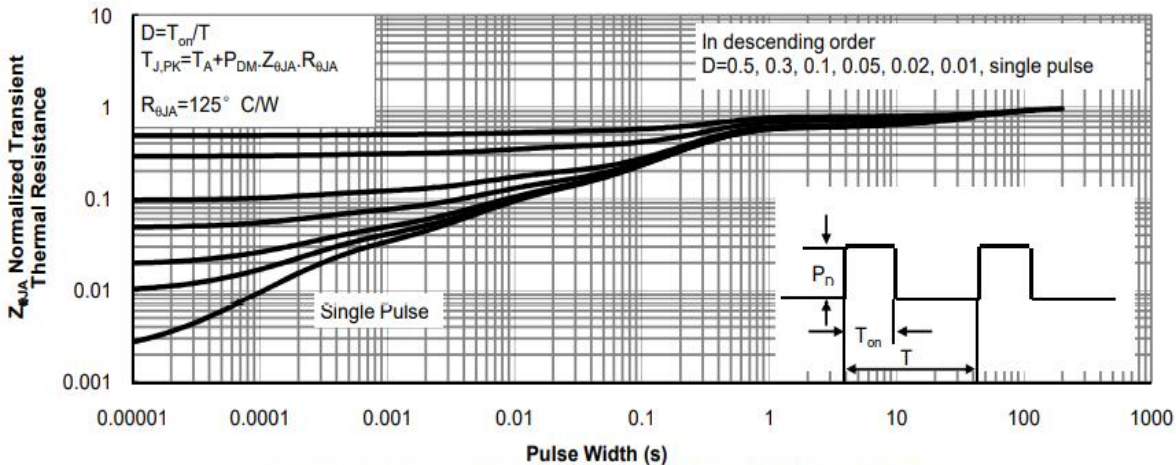
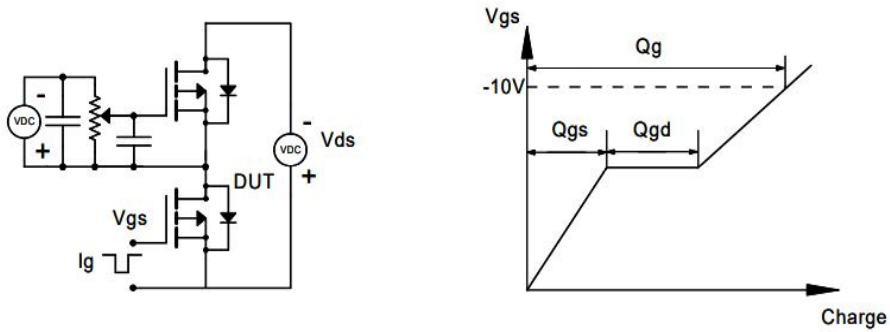


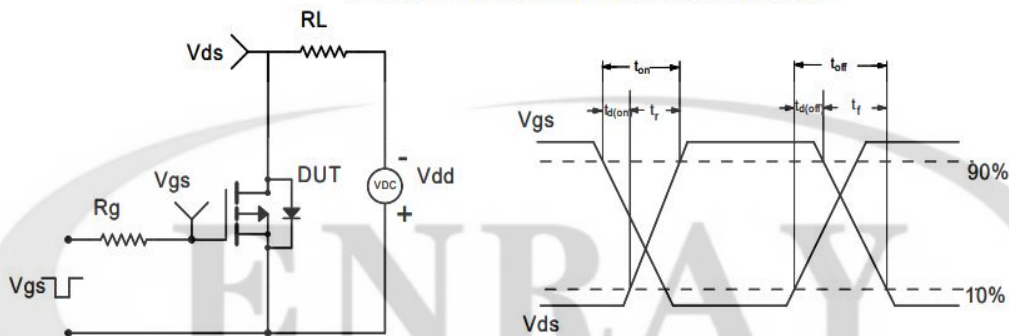
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Typical Electrical and Thermal Characteristics

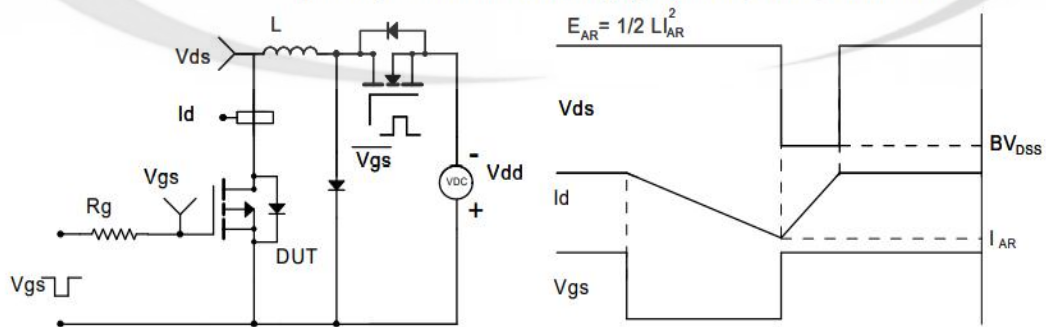
Gate Charge Test Circuit & Waveform



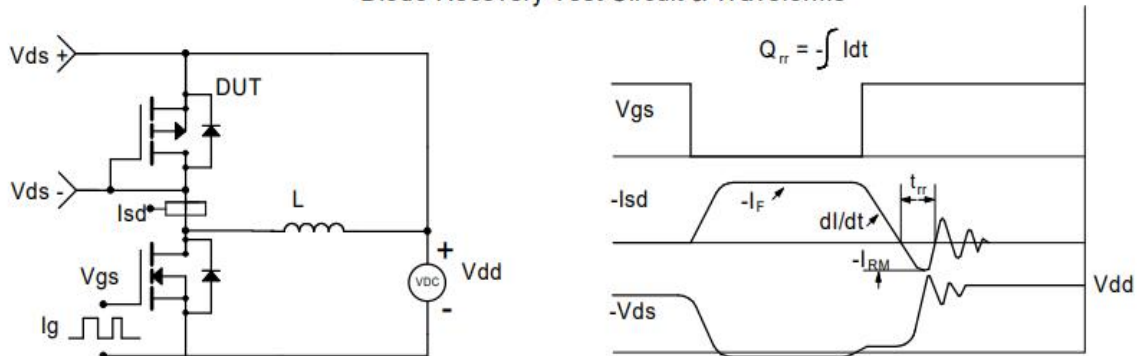
Resistive Switching Test Circuit & Waveforms

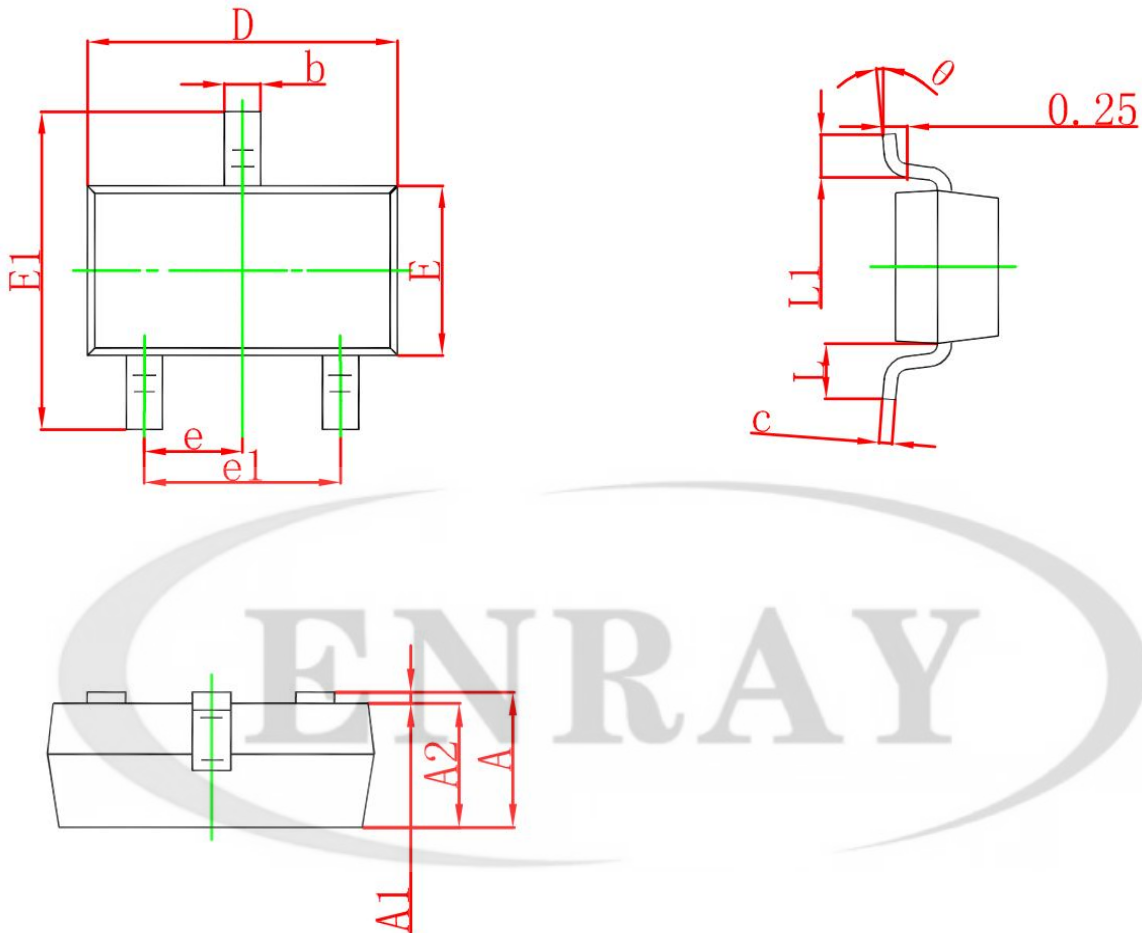


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



SOT-23 Package Outline Dimesions


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°