

## Description

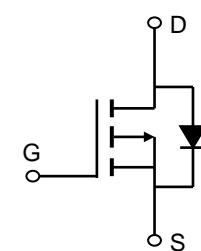
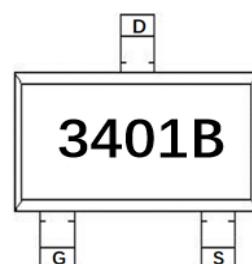
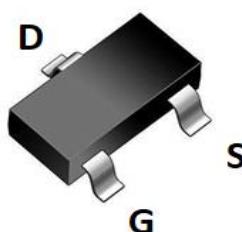
### JMT P-channel Enhancement Mode Power MosFET

#### Features

- -30V, -4A
- $R_{DS(ON)} < 62m\Omega$  @  $V_{GS} = -10V$
- $R_{DS(ON)} < 73m\Omega$  @  $V_{GS} = -4.5V$
- $R_{DS(ON)} < 98m\Omega$  @  $V_{GS} = -2.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free

#### Applications

- Load Switch
- PWM Application
- Power Management



SOT-23 Top View

Marking and Pin Assignment

Schematic Diagram

#### Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
3401B	JMTL3401B	TAPING	SOT-23	7"	3000	120000

#### Absolute Maximum Ratings (@ $T_A = 25^\circ C$ unless otherwise specified)

Symbol	Parameter		Value	Units
$V_{DS}$	Drain-to-Source Voltage		-30	V
$V_{GS}$	Gate-to-Source Voltage		$\pm 12$	V
$I_D$	Continuous Drain Current	$T_A = 25^\circ C$	-4	A
		$T_A = 100^\circ C$	-3	
$I_{DM}$	Pulsed Drain Current <sup>(1)</sup>		-16	A
$P_D$	Power Dissipation	$T_A = 25^\circ C$	1.2	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient <sup>(2)</sup>		108	°C/W
$T_J, T_{STG}$	Junction & Storage Temperature Range		-55 to 150	°C

**Electrical Characteristics** ( $T_J = 25^\circ\text{C}$  unless otherwise specified)

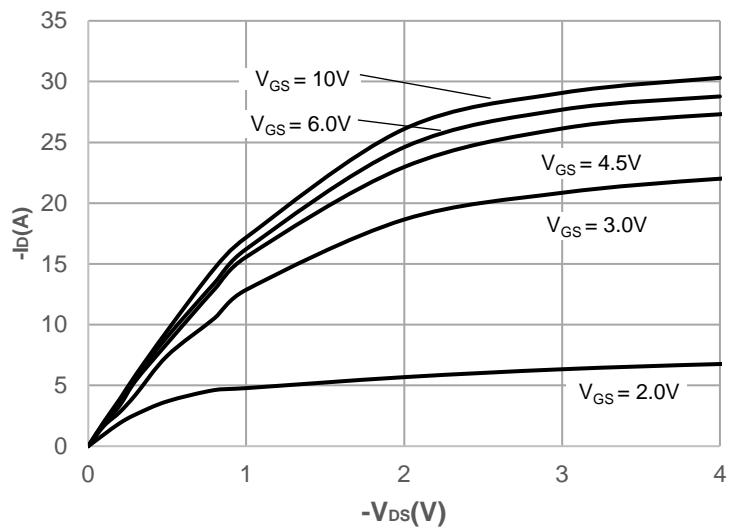
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$I_D = -250\mu\text{A}, V_{GS} = 0\text{V}$	-30	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$	-	-	1.0	$\mu\text{A}$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS} = 0\text{V}, V_{GS} = \pm 12\text{V}$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(\text{th})}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	-0.6	-0.95	-1.3	V
$R_{DS(\text{ON})}$	Static Drain-Source ON-Resistance <sup>(3)</sup>	$V_{GS} = -10\text{V}, I_D = -4\text{A}$	-	48	62	$\text{m}\Omega$
		$V_{GS} = -4.5\text{V}, I_D = -3\text{A}$	-	56	73	$\text{m}\Omega$
		$V_{GS} = -2.5\text{V}, I_D = -3\text{A}$	-	75	98	$\text{m}\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = -15\text{V}, f = 1\text{MHz}$	-	553	-	pF
$C_{oss}$	Output Capacitance		-	57	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	35	-	pF
$Q_g$	Total Gate Charge	$V_{GS} = 0 \text{ to } -4.5\text{V}$ $V_{DS} = -15\text{V}, I_D = -3\text{A}$	-	6.5	-	nC
$Q_{gs}$	Gate Source Charge		-	1.4	-	nC
$Q_{gd}$	Gate Drain("Miller") Charge		-	1.7	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = -4.5\text{V}, V_{DD} = -15\text{V}$ $I_D = -3\text{A}, R_{GEN} = 3\Omega$	-	10	-	ns
$t_r$	Turn-On Rise Time		-	86	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	150	-	ns
$t_f$	Turn-Off Fall Time		-	357	-	ns
<b>Drain-Source Diode Characteristics and Max Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current	-	-	-4	-	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current	-	-	-16	-	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0\text{V}, I_S = -4\text{A}$	-	-	-1.2	V
$trr$	Body Diode Reverse Recovery Time	$I_F = -3\text{A}, di/dt = 80\text{A/us}$	-	36	-	ns
$Qrr$	Body Diode Reverse Recovery Charge		-	5	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

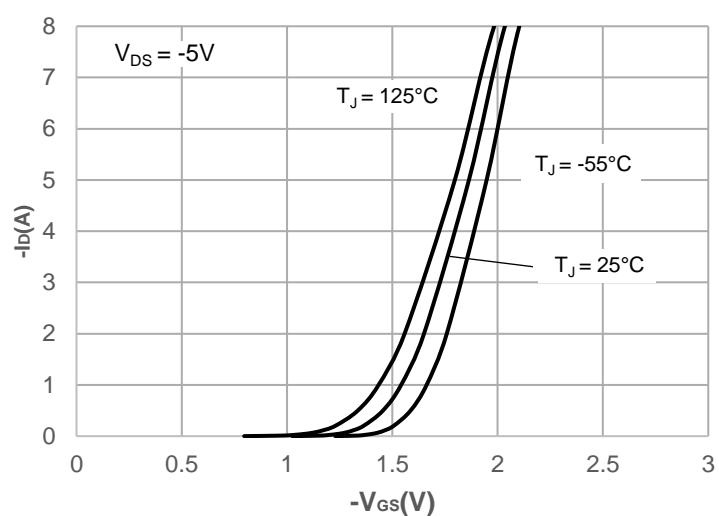
2.  $R_{\theta JA}$  is measured with the device mounted on a 1inch<sup>2</sup> pad of 2oz copper FR4 PCB3. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 0.5\%$ .

## Typical Performance Characteristics

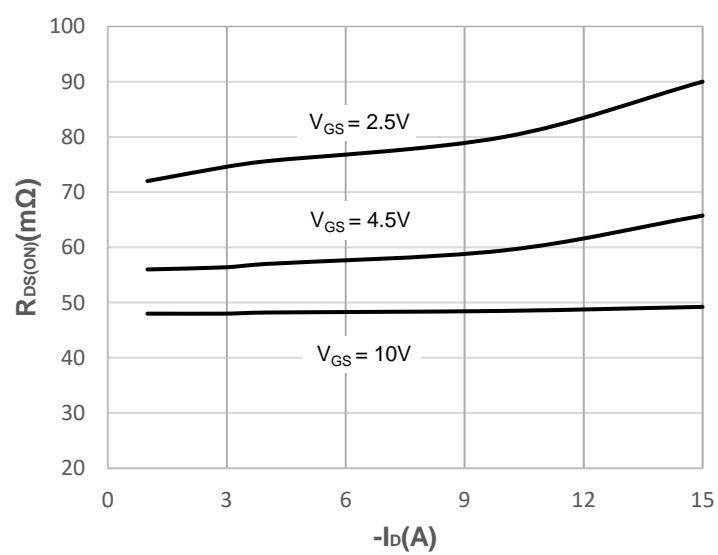
**Figure 1: Output Characteristics**



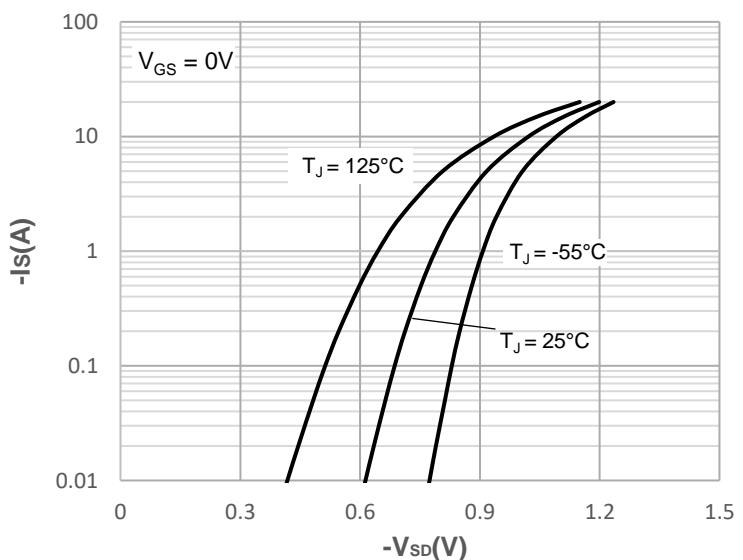
**Figure 2: Typical Transfer Characteristics**



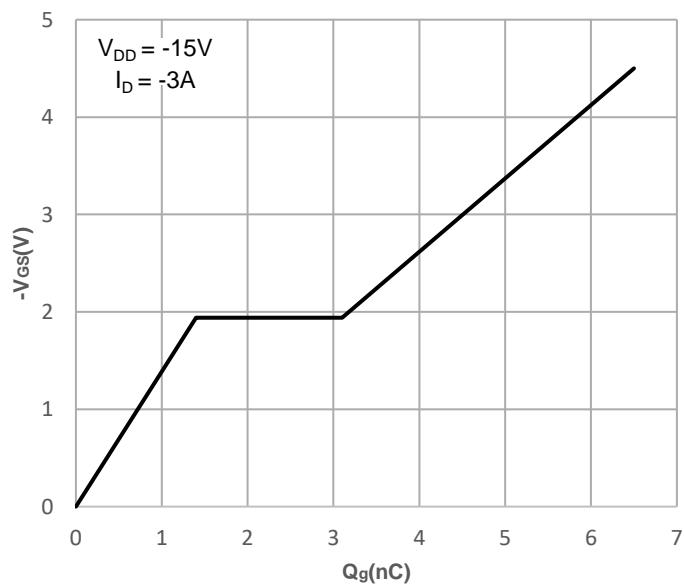
**Figure 3: On-resistance vs. Drain Current**



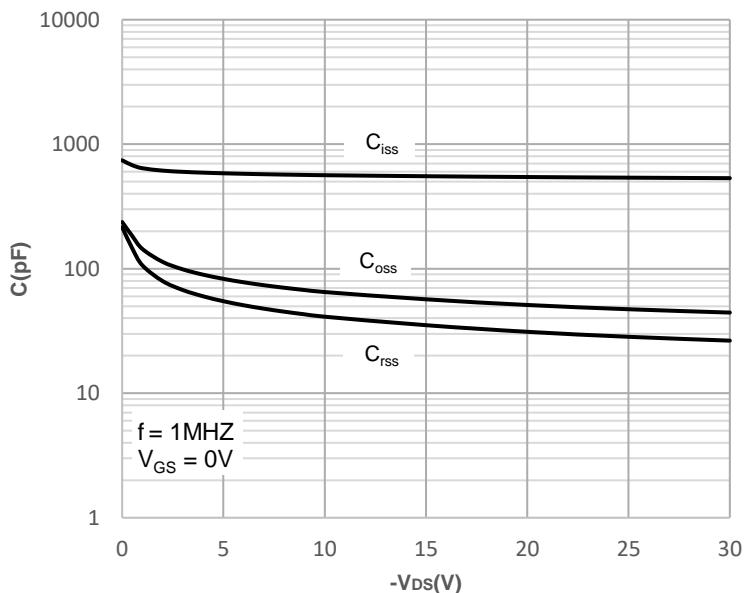
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

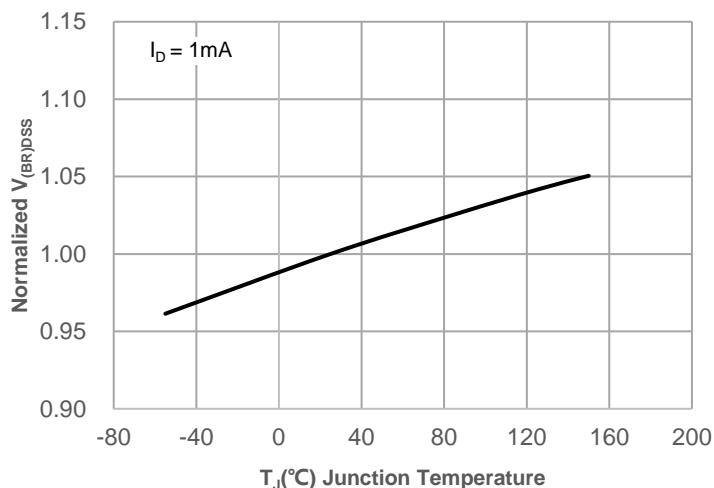


**Figure 6: Capacitance Characteristics**

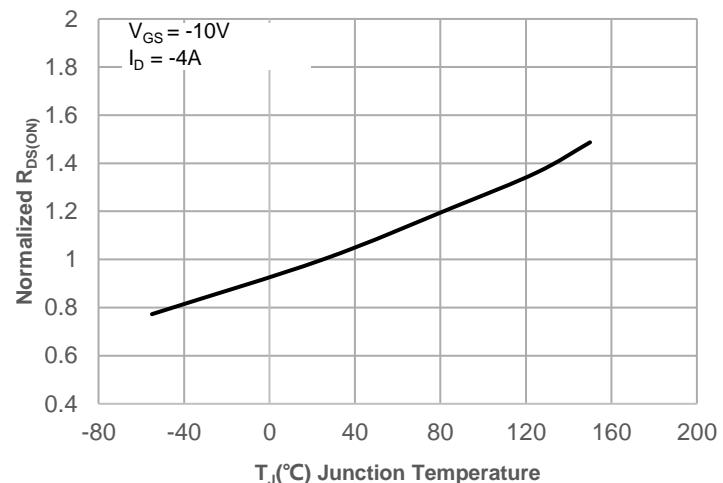


## Typical Performance Characteristics

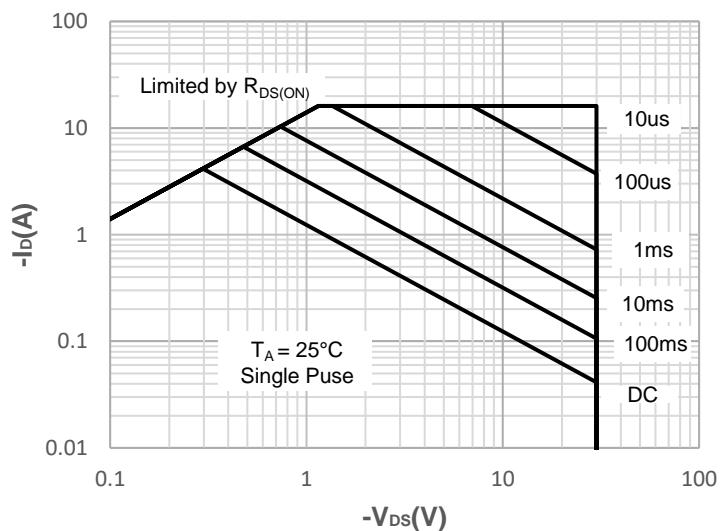
**Figure 7: Normalized Breakdown voltage vs. Junction Temperature**



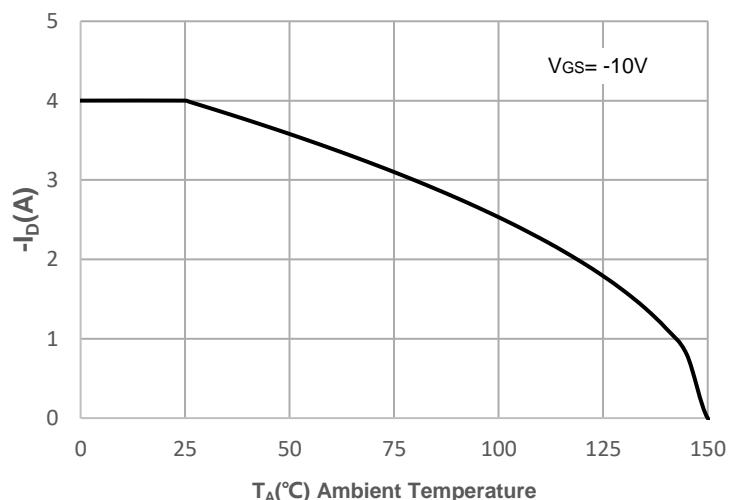
**Figure 8: Normalized on Resistance vs. Junction Temperature**



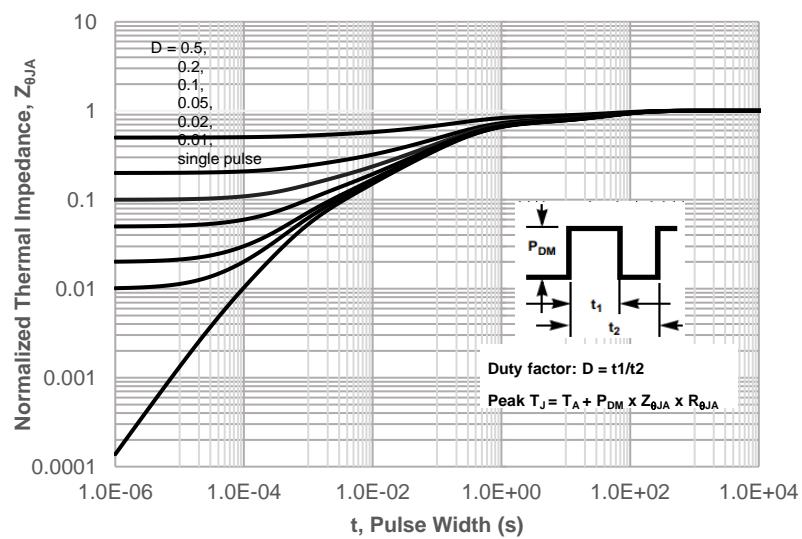
**Figure 9: Maximum Safe Operating Area**



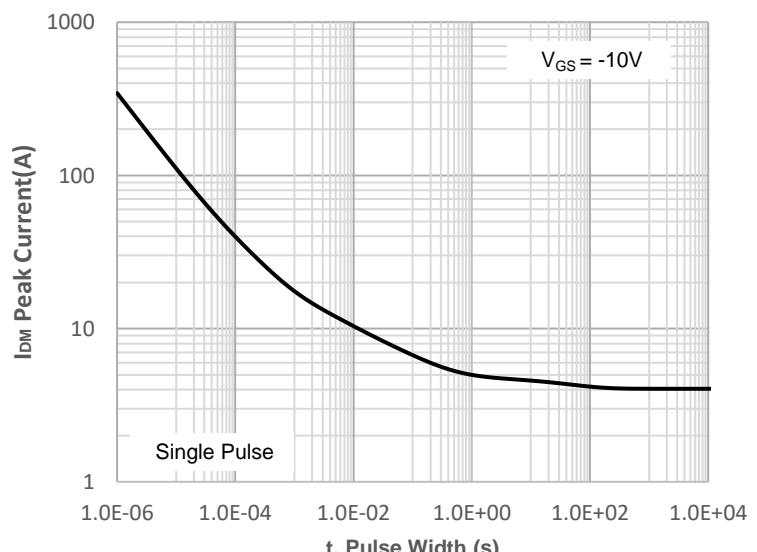
**Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature**



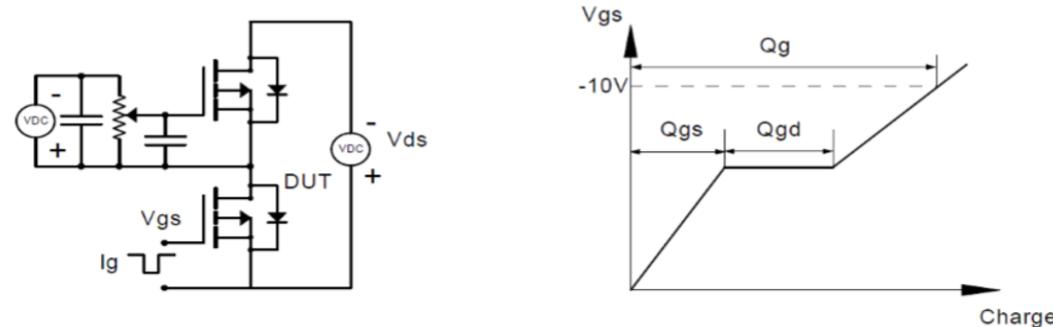
**Figure 11: Normalized Maximum Transient Thermal Impedance**



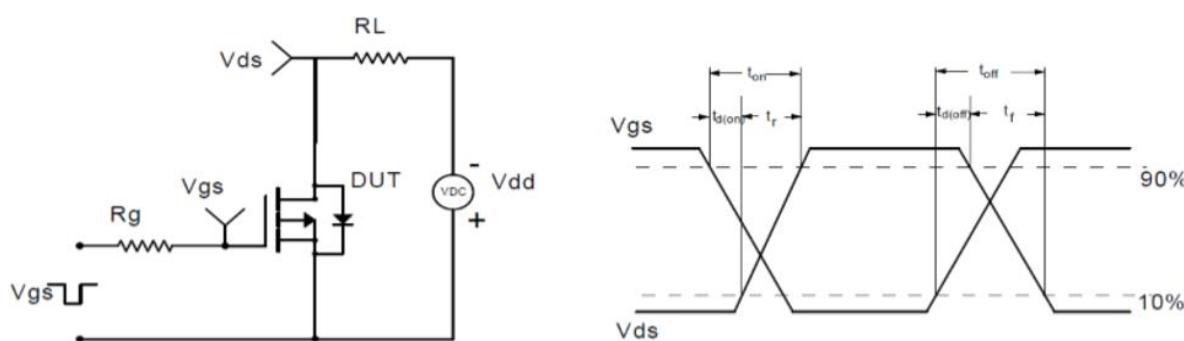
**Figure 12: Peak Current Capacity**



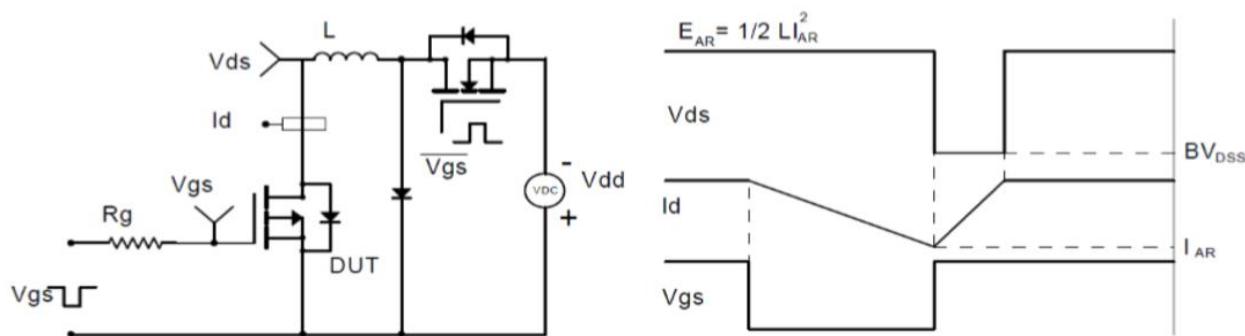
## Test Circuit



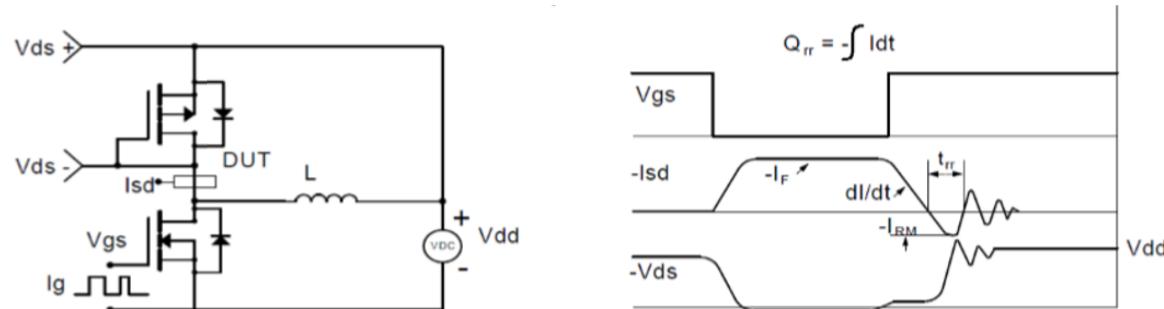
**Figure 1: Gate Charge Test Circuit & Waveform**



**Figure 2: Resistive Switching Test Circuit & Waveform**

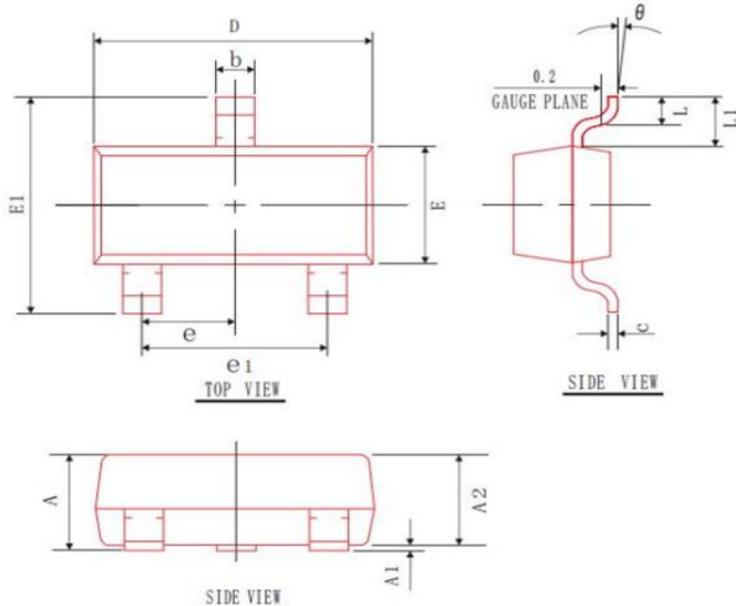


**Figure 3: Unclamped Inductive Switching Test Circuit & Waveform**



**Figure 4: Diode Recovery Test Circuit & Waveform**

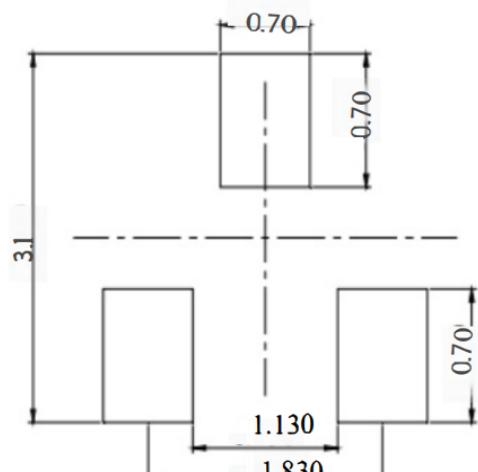
## Package Mechanical Data(SOT-23)



COMMON DIMENSIONS  
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		

### Recommended Footprint



DIMENSIONS: MILLIMETERS

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