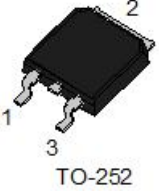
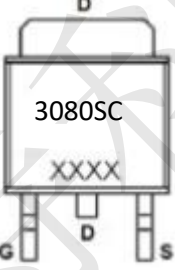
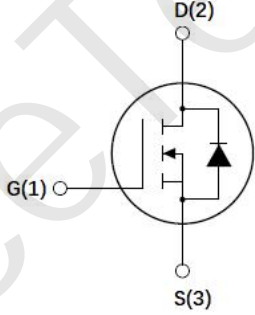




**FM3080SC N-Channel Trench Power MOSFET**

**FM3080SC Description**

<p><b>Features</b></p> <ul style="list-style-type: none"><li>• 30V,65A</li><li>• <math>R_{DS(ON)}=5.4m\Omega</math> (Typ.) @ <math>V_{GS}=10V</math></li><li>• <math>R_{DS(ON)}=7.8m\Omega</math> (Typ.) @ <math>V_{GS}=4.5V</math></li><li>• Advanced Trench Technology</li><li>• Provide Excellent <math>R_{DS(ON)}</math> and Low Gate Charge</li></ul>	<p><b>Application</b></p> <ul style="list-style-type: none"><li>• Load Switch</li><li>• PWM Application</li></ul>
<p><b>Package</b></p>   	

**FM3080SC Absolute Maximum Ratings** ( $T_c=25^\circ C$  unless otherwise specified)

Symbol	Parameter	Value	Units	
$V_{DSS}$	Drain-Source Voltage	30	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V	
$I_D$	Continuous Drain Current	$T_c = 25^\circ C$	65	A
		$T_c = 100^\circ C$	41	A
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>	197	A	
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>	144	mJ	
$P_D$	Power Dissipation	$TC = 25^\circ C$	32	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.9	$^\circ C/W$	
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +150	$^\circ C$	



### FM3080SC N-Channel Trench Power MOSFET

#### FM3080SC Electrical Characteristics (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.6	2	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note3</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	5.4	6.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	-	7.8	9.4	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =20A	-	64	-	S
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1.0MHz	-	1282	-	pF
C <sub>oss</sub>	Output Capacitance		-	192	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	177	-	pF
R <sub>g</sub>	Gate resistance		-	2.1	-	Ω
<b>Switching Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V	-	27.1	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	3.8	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	6.8	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V RL=0.75Ω, R <sub>GEN</sub> =3Ω,	-	10.5	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	60	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	24.5	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	13.5	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	65	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	197	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =30A	-	-	1.2	V

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

2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



### FM3080SC N-Channel Trench Power MOSFET

#### FM3080SC Typical Performance Characteristics

Figure 1: On-Region Characteristics

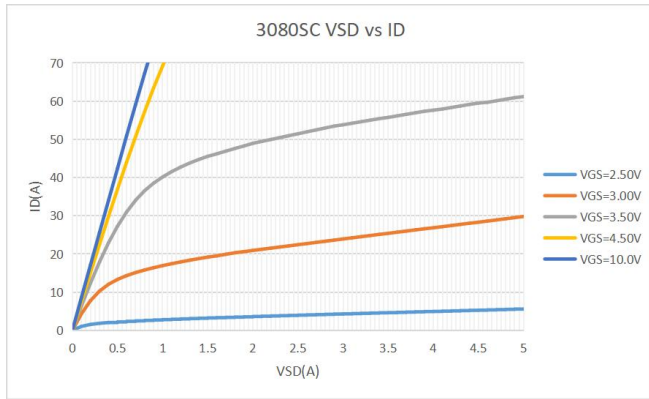


Figure 2: Transfer Characteristics

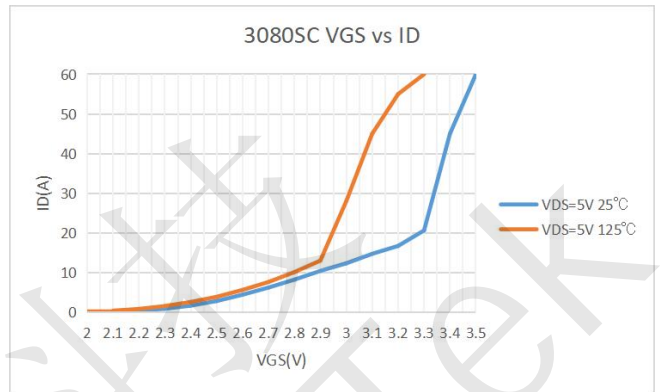


Figure 3: On-resistance vs. Drain Current and Gate Voltage

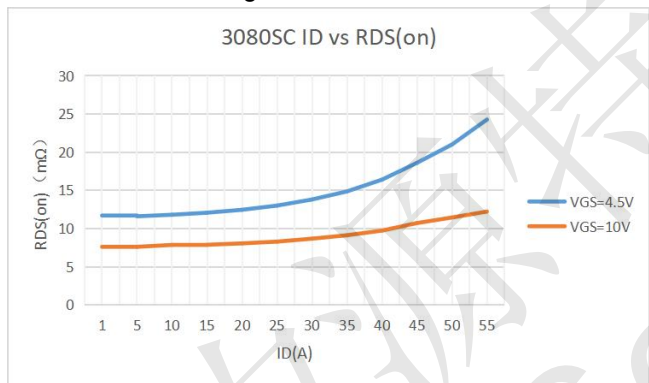


Figure 4: On-Resistance vs. Gate-Source Voltage

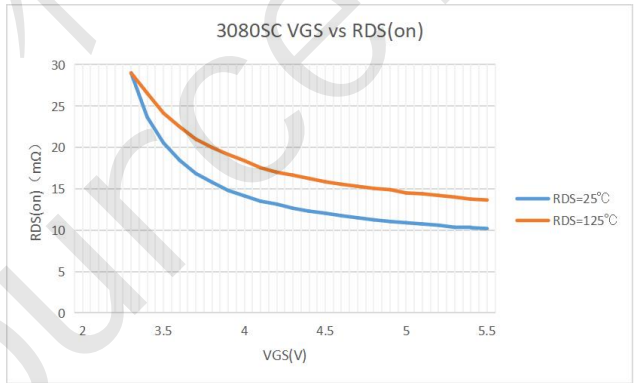


Figure 5: On-Resistance vs. Junction Temperature

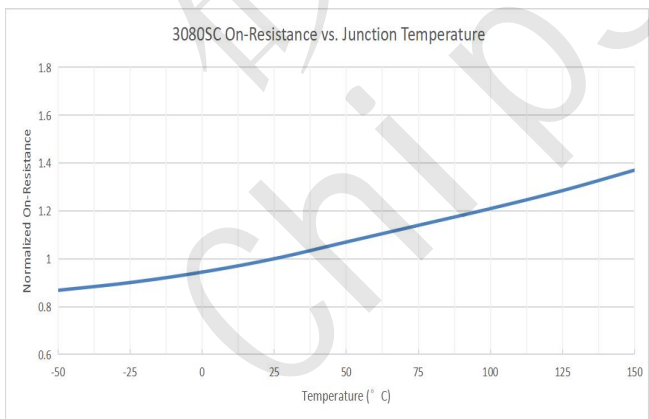
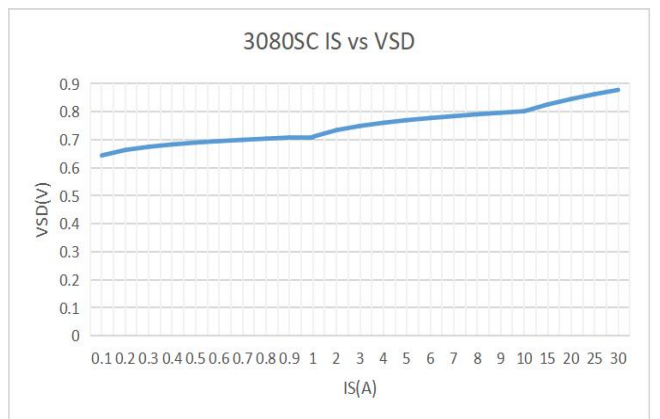


Figure 6: Body-Diode Characteristics





## FM3080SC N-Channel Trench Power MOSFET

### FM3080SC Typical Performance Characteristics

Figure7: Capacitance Characteristics C(pF)

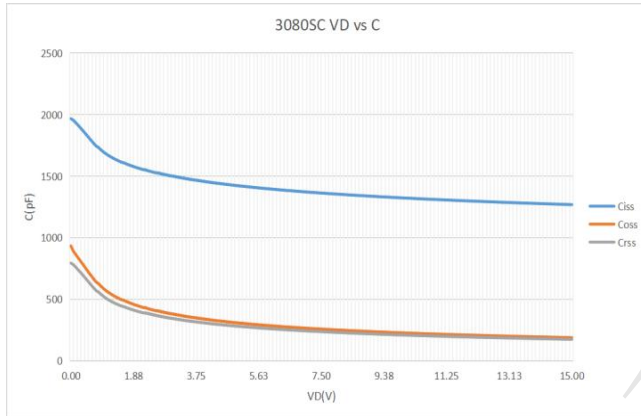


Figure 8: Current De-rating

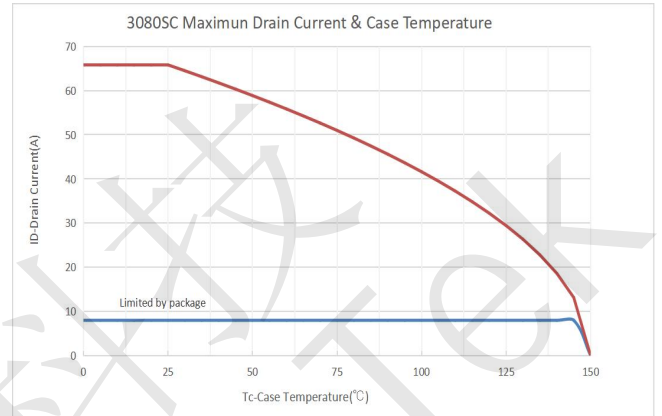
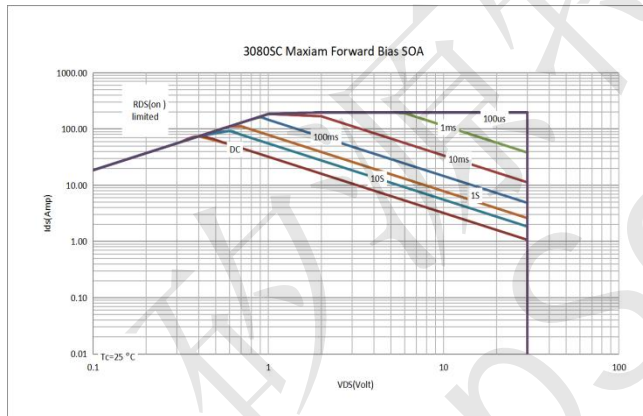


Figure9: Maximum Forward Biased Safe Operating Area





FM3080SC N-Channel Trench Power MOSFET

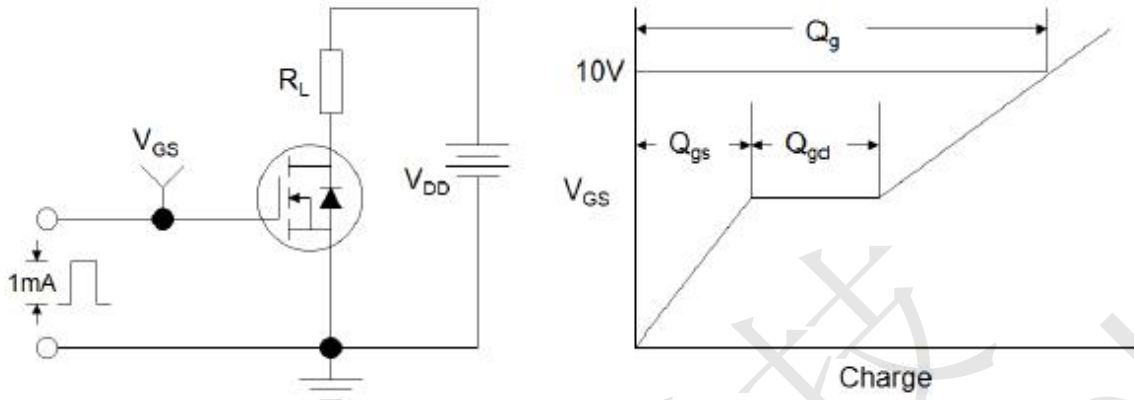


Figure1:Gate Charge Test Circuit & Waveform

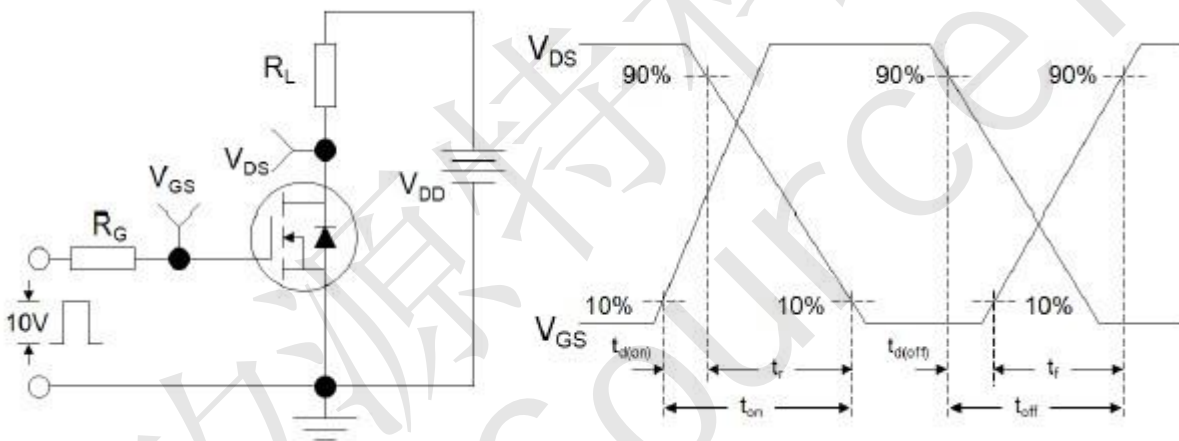


Figure 2: Resistive Switching Test Circuit & Waveforms

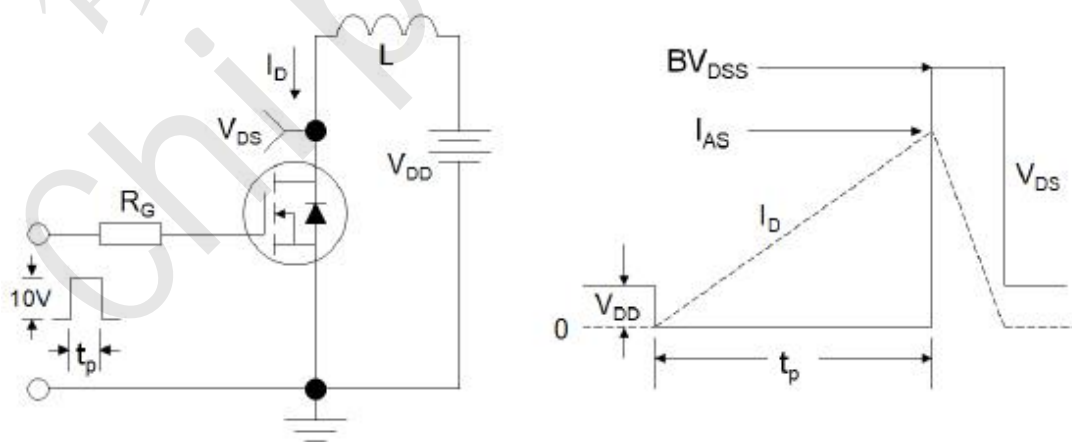
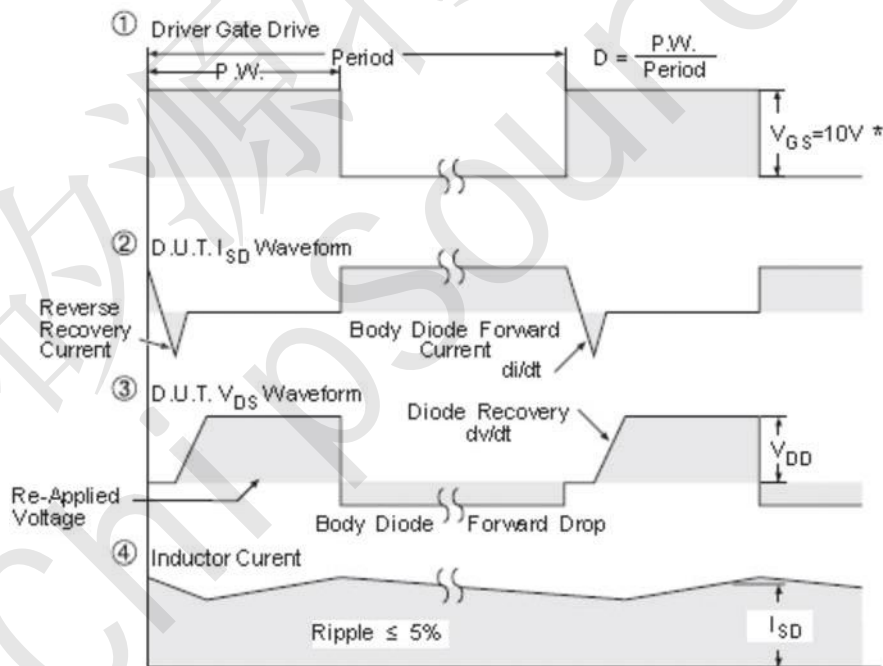
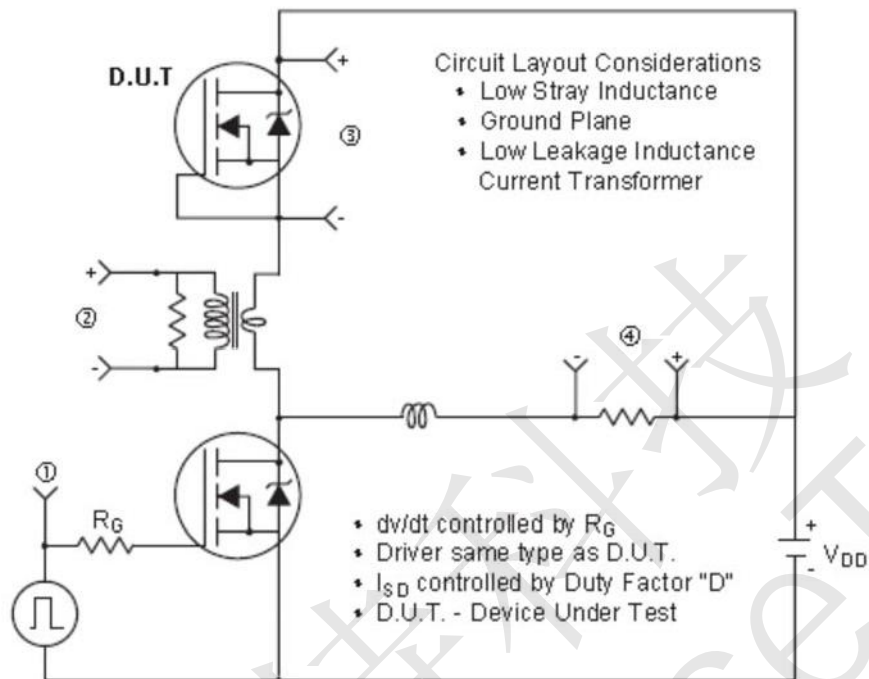


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



## FM3080SC N-Channel Trench Power MOSFET



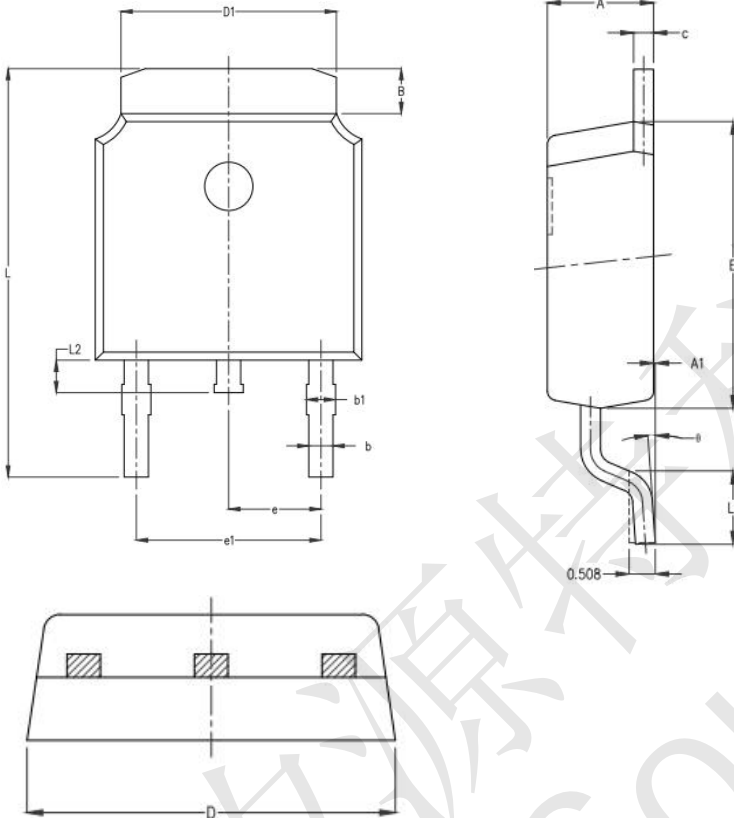
\*  $V_{GS} = 5V$  for Logic Level Devices

Figure 4: Peak Diode Recovery  $dv/dt$  Test Circuit & Waveforms (For N-channel)



FM3080SC N-Channel Trench Power MOSFET

FM3080SC TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.15	2.25	2.35
A1	0.00	0.06	0.12
B	0.96	1.11	1.26
b	0.59	0.69	0.79
b1	0.69	0.81	0.93
c	0.34	0.42	0.50
D	6.45	6.60	6.75
D1	5.23	5.33	5.43
E	5.95	6.10	6.25
e	2.286TYP.		
e1	4.47	4.57	4.67
L	9.90	10.10	10.30
L1	1.40	1.55	1.70
L2	0.60	0.80	1.00
$\theta$	0°	4°	8°