JMTC3003A

Description

JMT N-channel Enhancement Mode Power MOSFET

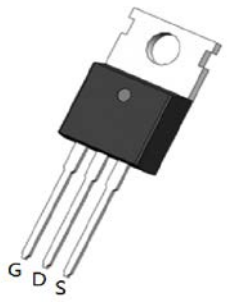
Features

- 30V, 150A
  $R_{DS(ON)}$ < 3.3mΩ @ V_{GS} = 10V
  $R_{DS(ON)}$ < 6.2mΩ @ V_{GS} = 4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

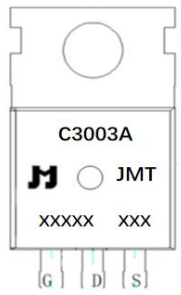
Applications

- Load Switch
- PWM Application
- Power Management

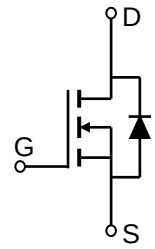
100% UIS TESTED!
100% ΔVds TESTED!



TO-220C-3L Top View



Marking and Pin Assignment



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	Outline	Package	TUBE (PCS)	Inner Box (PCS)	Per Carton (pcs)
JMTC3003A	JMTC3003A	TUBE	TO-220C-3L	50	1000	5000

Absolute Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		30	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	150	A
		T_C = 100°C	95	
I_{DM}	Pulsed Drain Current (1)		600	A
E_{AS}	Single Pulsed Avalanche Energy (2)		210	mJ
P_D	Power Dissipation	T_C = 25°C	89	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (3)		56	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.40	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	μA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.9	2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 30A	-	2.5	3.3	mΩ
		V_{GS} = 4.5V, I_D =20A	-	4.8	6.2	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz	-	3650	-	pF
C_{oss}	Output Capacitance		-	494	-	pF
C_{rss}	Reverse Transfer Capacitance		-	366	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DD} = 30V, I_D = 15A	-	67	-	nC
Q_{gs}	Gate Source Charge		-	11	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	19	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 15V I_D= 30A, R_{GEN} = 3Ω	-	10	-	ns
t_r	Turn-On Rise Time		-	19	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	50	-	ns
t_f	Turn-Off Fall Time		-	20	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	150	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	600	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=20A,di/dt=100A/μs	-	18	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	6	-	nC

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

2. E_{AS} condition: Starting T_J=25℃, V_{DD}=15V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=29A.

3. $R_{\theta JA}$ is measured with the device mounted on a minimum recommended pad of 2oz copper FR4 PCB.

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

Typical Performance Characteristics

Figure 1: Output Characteristics

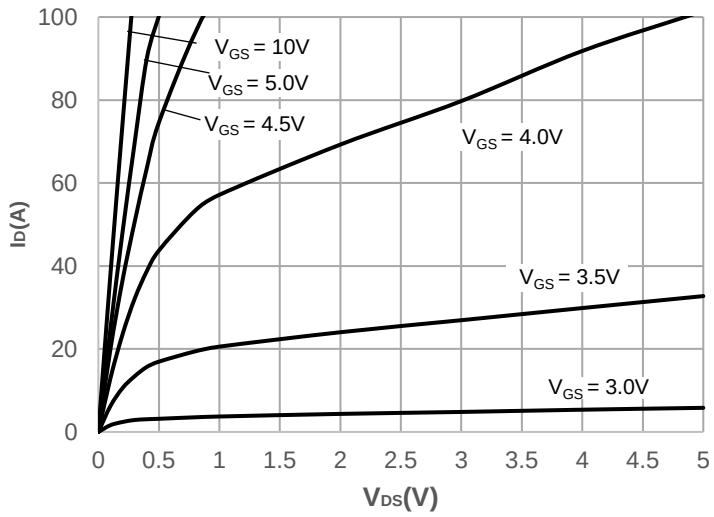


Figure 2: Typical Transfer Characteristics

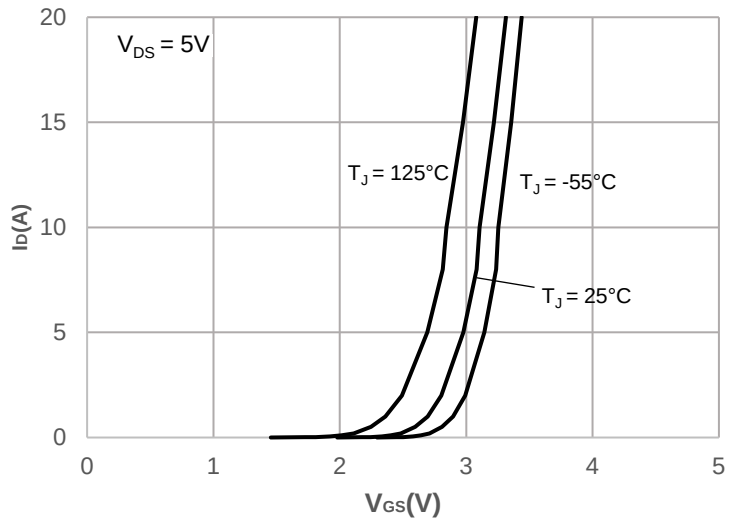


Figure 3: On-resistance vs. Drain Current

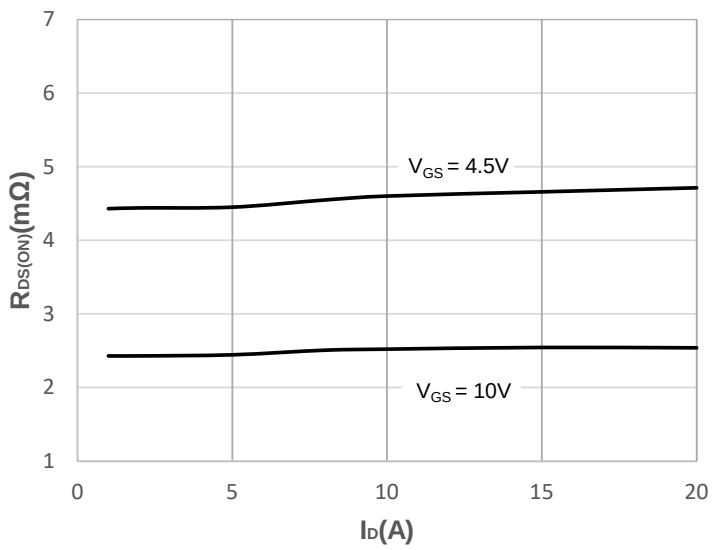


Figure 4: Body Diode Characteristics

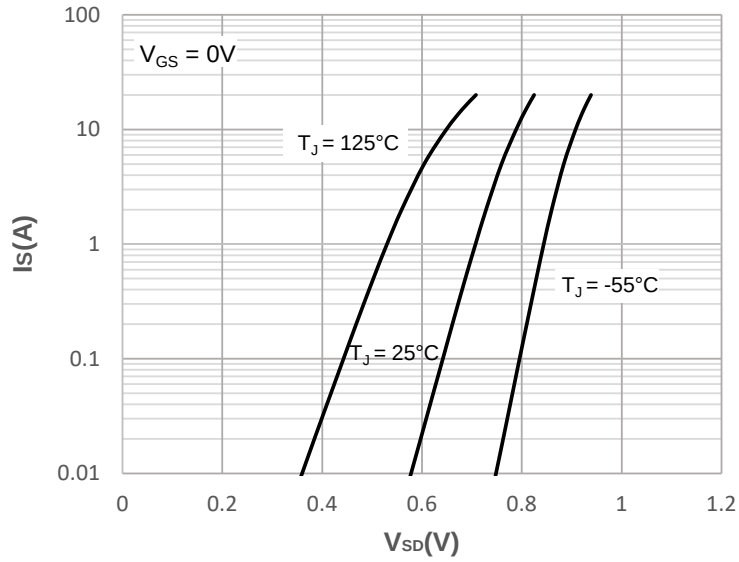


Figure 5: Gate Charge Characteristics

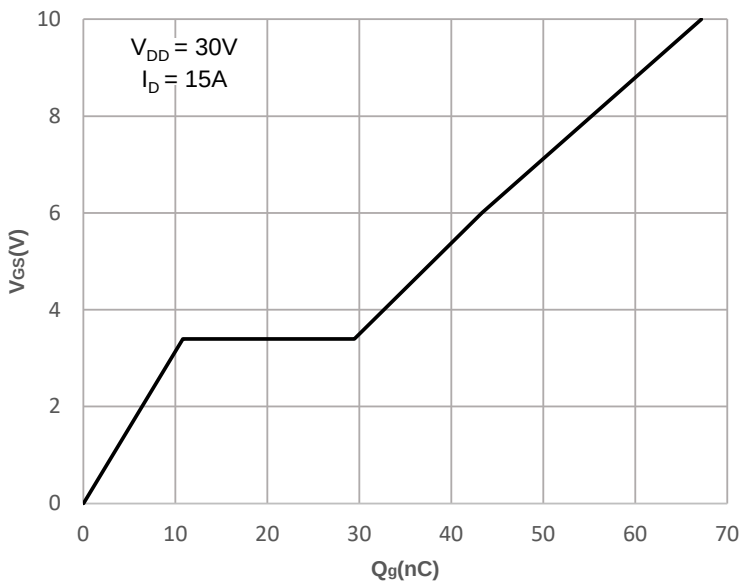
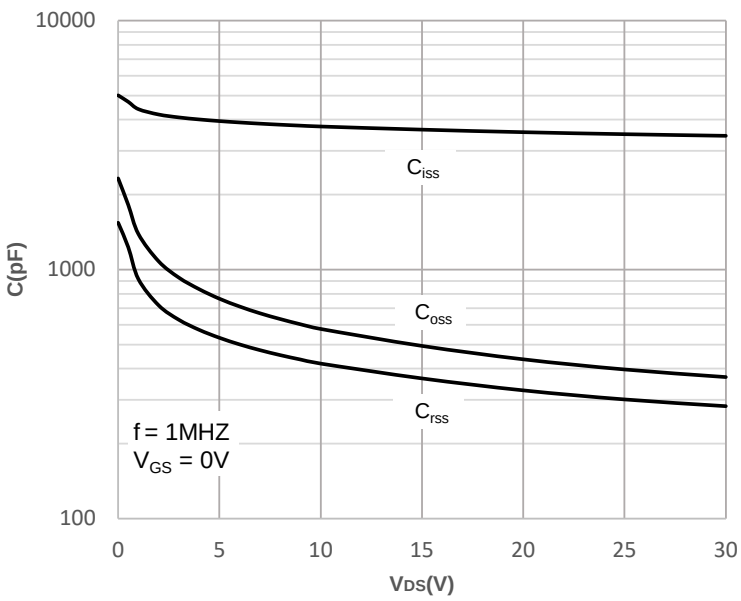


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

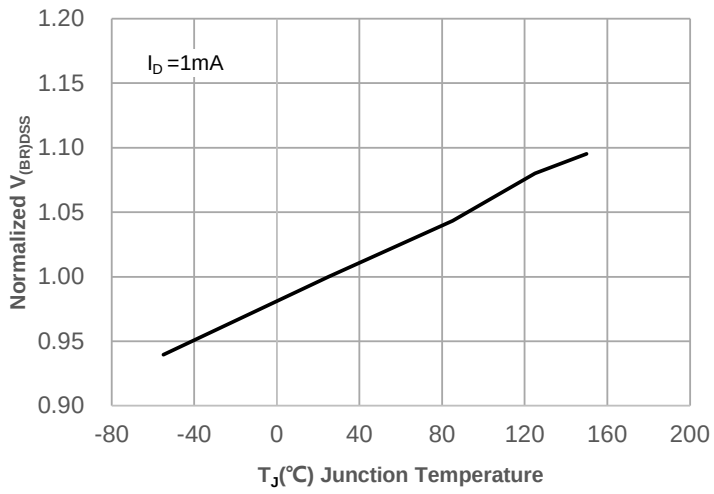


Figure 8: Normalized on Resistance vs. Junction Temperature

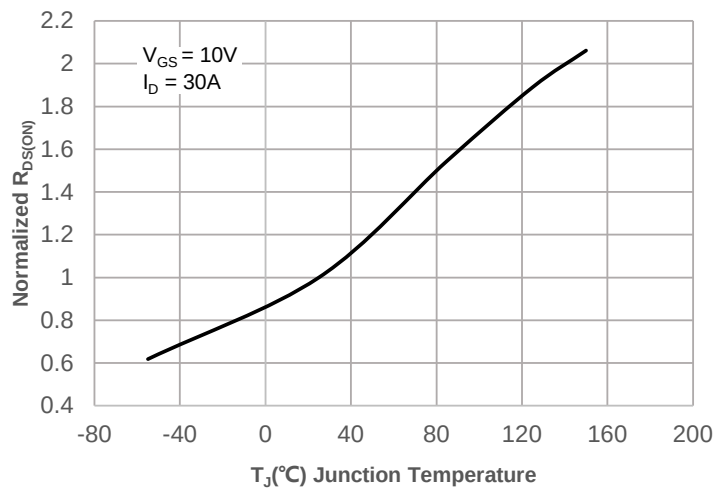


Figure 9: Maximum Safe Operating Area

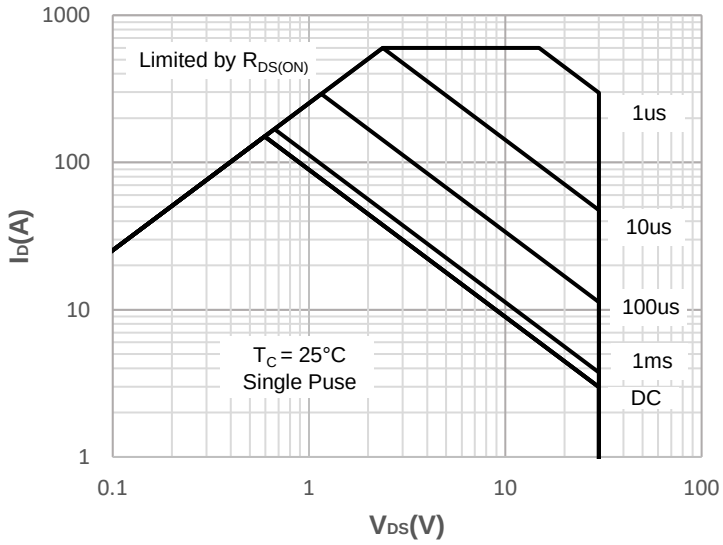


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

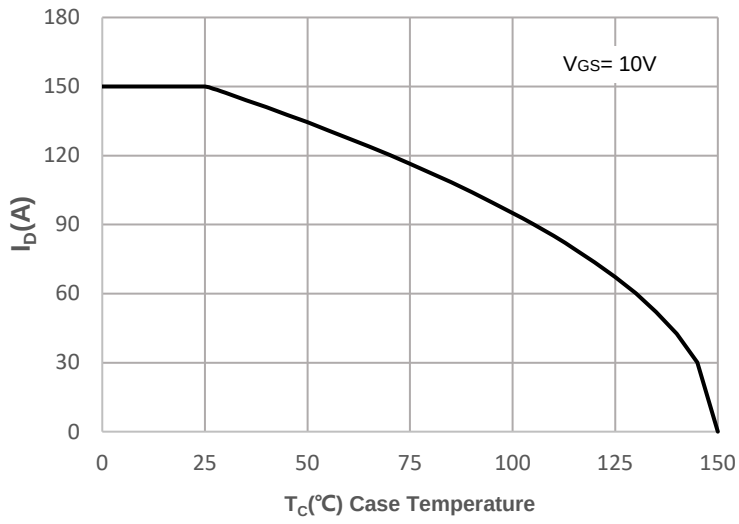


Figure 11: Normalized Maximum Transient Thermal Impedance

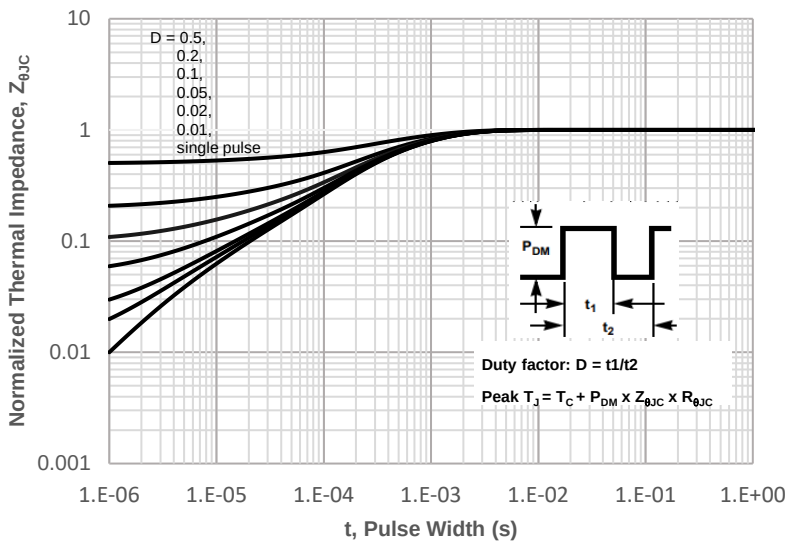
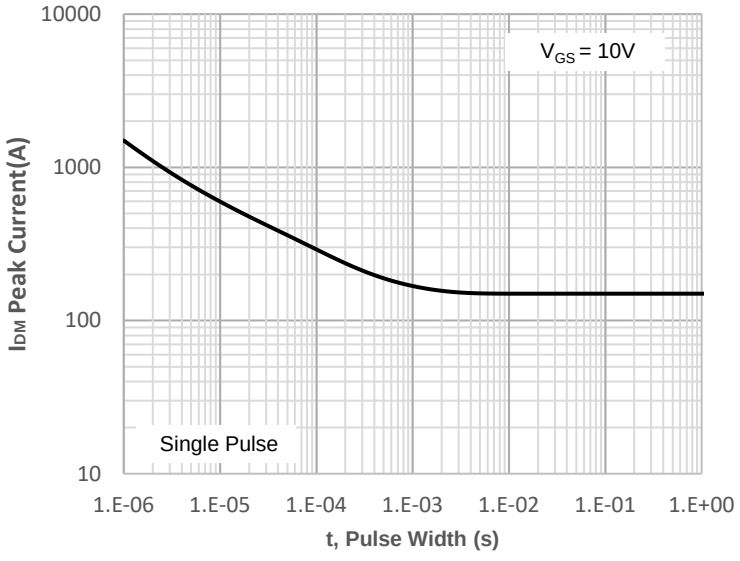


Figure 12: Peak Current Capacity



Test Circuit

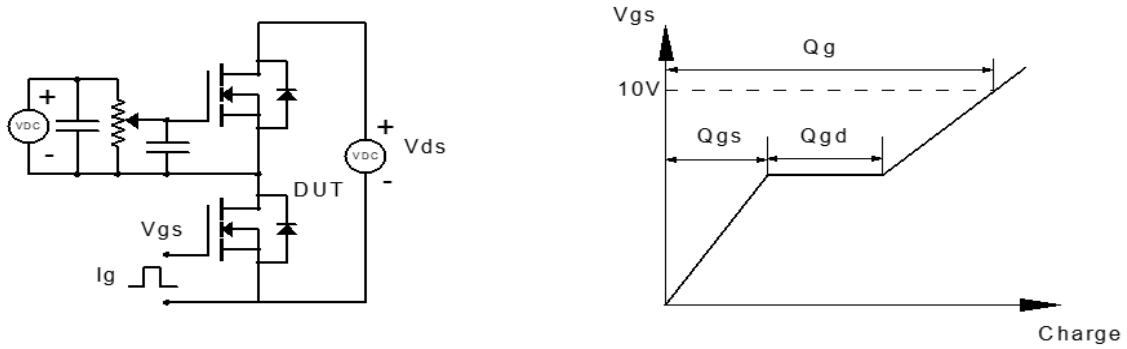


Figure 1: Gate Charge Test Circuit & Waveform

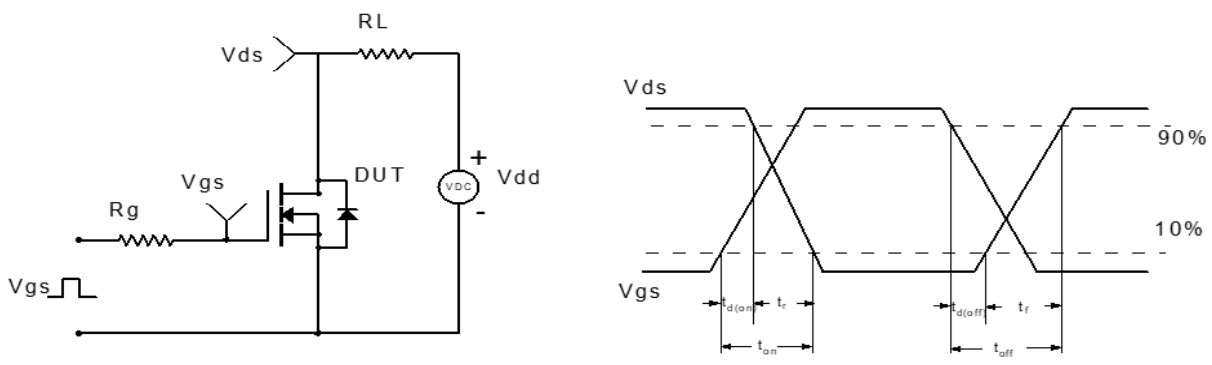


Figure 2: Resistive Switching Test Circuit & Waveform

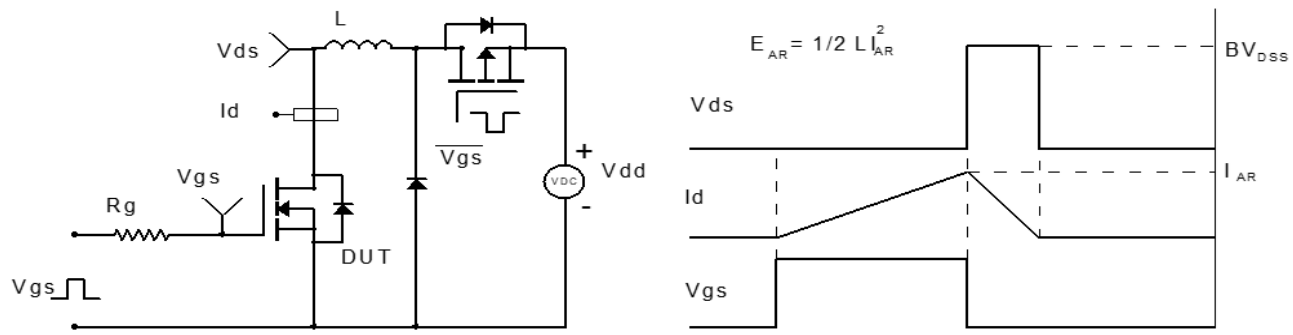


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

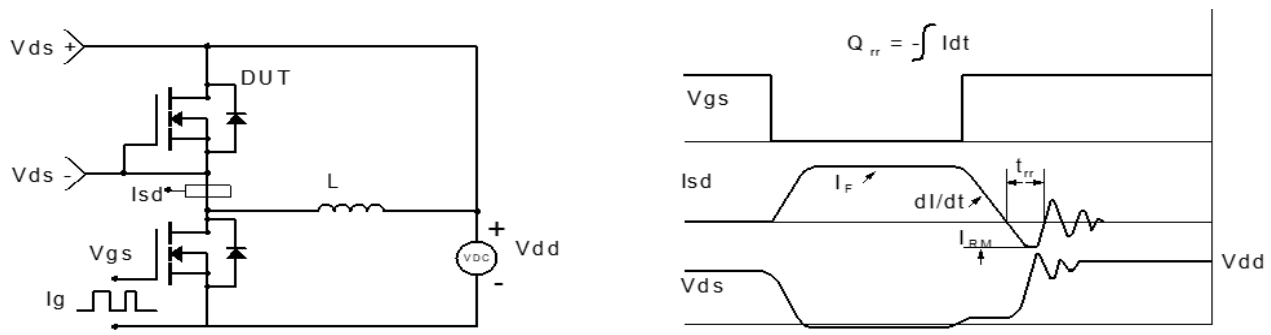
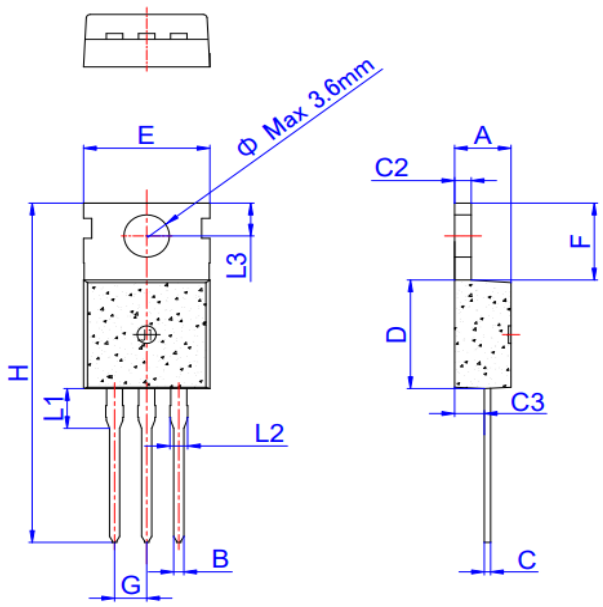


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(TO-220C-3L)



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.39			0.133	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	