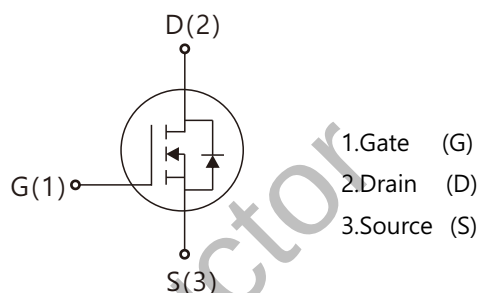
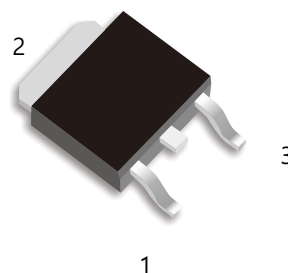


FQD5N20**Features:**

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge : $Q_g = 13.5\text{nC}$ (Typ.).
- ☐ $BVDSS = 200\text{V}$, $I_D = 5.0\text{A}$
- ☐ $R_{DS(on)} : 450\text{m}\Omega$ (Typ.) @ $V_{GS} = 10\text{V}$
- ☐ 100% Avalanche Tested



TO-252

**Absolute Maximum Ratings** ($T_a = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	200	V
I_D	Drain Current	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	
$V_{GS(TH)}$	Gate Threshold Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy (note1)	45	mJ
I_{AR}	Avalanche Current (note2)	20	A
P_D	Power Dissipation ($T_j = 25^\circ\text{C}$)	45	W
T_j	Junction Temperature(Max)	150	$^\circ\text{C}$
T_{stg}	Storage Temperature	$-55 \sim +150$	$^\circ\text{C}$
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	-	2.5	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	-	62.5	$^\circ\text{C/W}$

Electrical Characteristics (Ta=25 °C unless other wise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA , V _{GS} =0	200	-	-	V
△BVDSS/ △TJ	Breakdown Voltage Temperature Coefficient	I _D =250μA ,Reference to 25 °C		0.25	-	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =200V, V _{GS} =0V	-	-	1	μA
		V _{DS} =160V, Tc=125°C			10	
I _{GSSF}	Gate-body leakage Current, Forward	V _{GS} =+20V, V _{DS} =0V	-	-	100	nA
I _{GSSR}	Gate-body leakage Current, Reverse	V _{GS} =-20V, V _{DS} =0V	-	-	-100	nA
On Characteristics						
V _{GS(TH)}	Date Threshold Voltage	I _D =250μA,V _{DS} =V _{GS}	1	1.8	3	V
R _{DS(ON)}	Static Drain-Source On-Resistance	I _D =2.0A,V _{GS} =10V		450	600	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	V _{DS} =25V , V _{GS} =0V f=1.0MHz	-	462	-	pF
Coss	Output Capacitance		-	55	-	pF
Crss	Reverse Transfer Capacitance		-	8.8	-	pF
Switching Characteristics						
Td(on)	Turn-On Delay Time	V _{DD} =100V , I _D =5A R _G =25 Ω (Note 3,4)		10		ns
Tr	Turn-On Rise Time			25		ns
Td(off)	Turn-Off Delay Time			40		ns
Tf	Turn-Off Rise Time			52		ns
Qg	Total Gate Charge	V _{DS} =160V, V _{GS} =10V, I _D =5A (Note 3,4)		13.5		nC
Qgs	Gate-Source Charge			3.0		nC
Qgd	Gate-Drain Charge			6.2		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Is	Diode Forward Current		-	-	5.0	A
ISM	Max. Pulsue Diode Forward Current	-		- -	20	A
VSD	Diode Forward Voltage	I _D =5A	-	-	1.4	V
Trr	Reverse Recovery Time	Is=5.0A,VGS =0V diF/dt=100A/μs (Note3)		220		nS
Qrr	Reverse Recovery Charge		-	3.0	-	μC

Notes : 1, L=0.5mH, IAS=5 A, VDD=50V, RG=25 Ω Starting TJ =25 °C

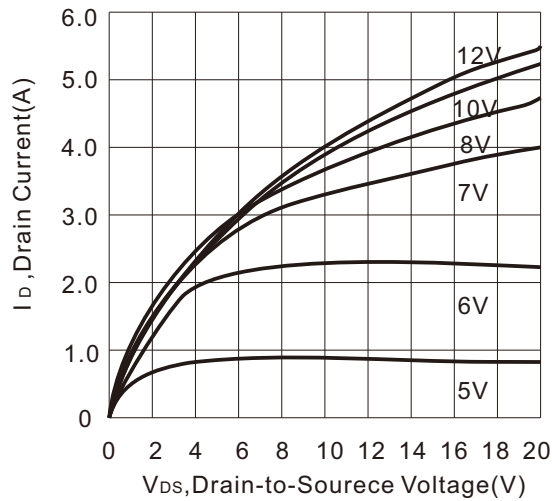
2, Repetitive Rating : Pulse width limited by maximum junction temperature

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

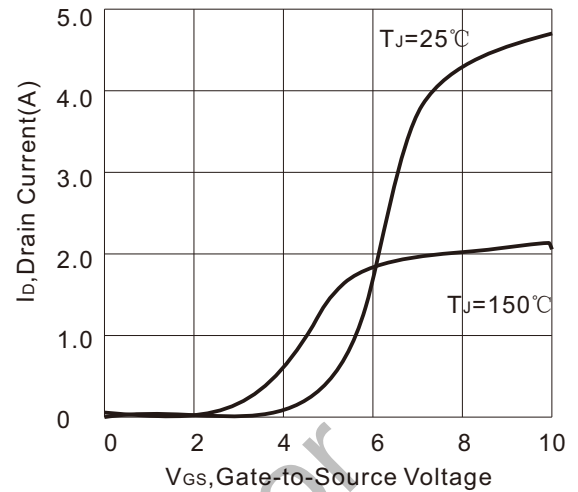
4, Essentially Independent of Operating Temperature

TYPICAL CHARACTERISTICS

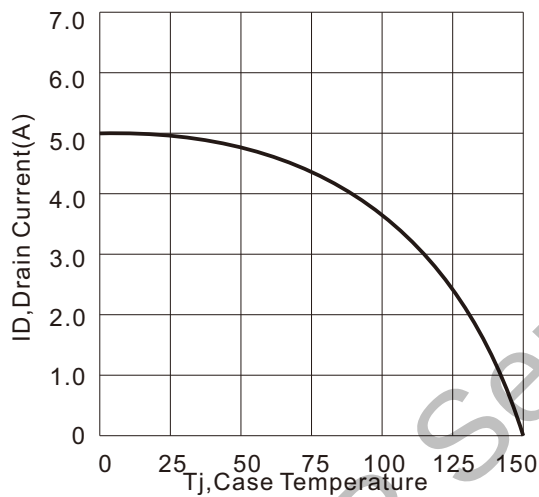
Output Characteristics



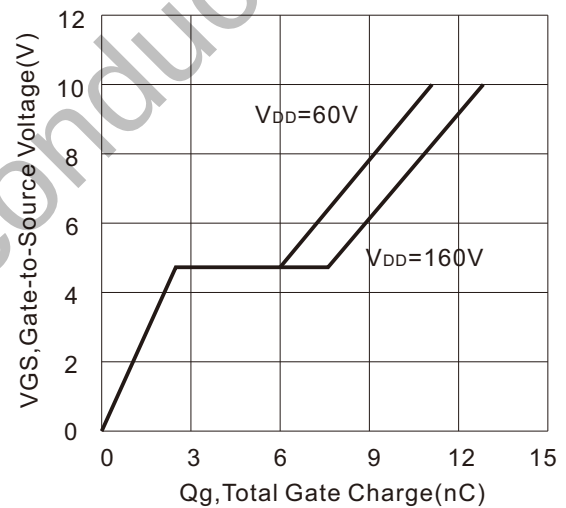
Transfer Characteristics



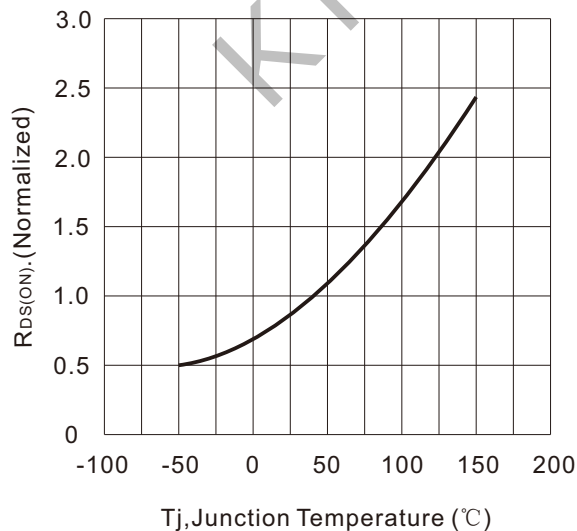
Drain Current VS. Temperature



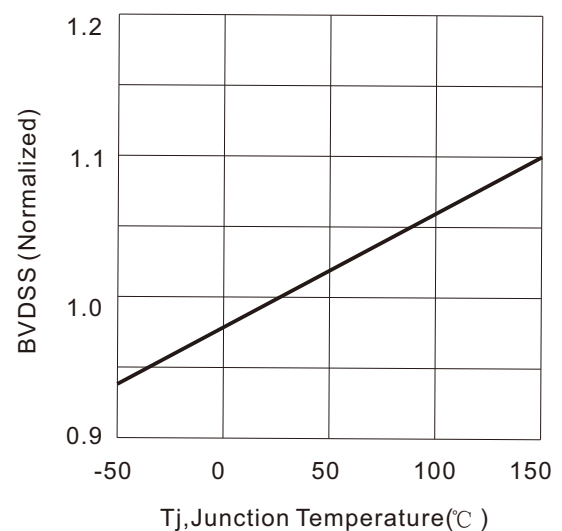
Gate Charge



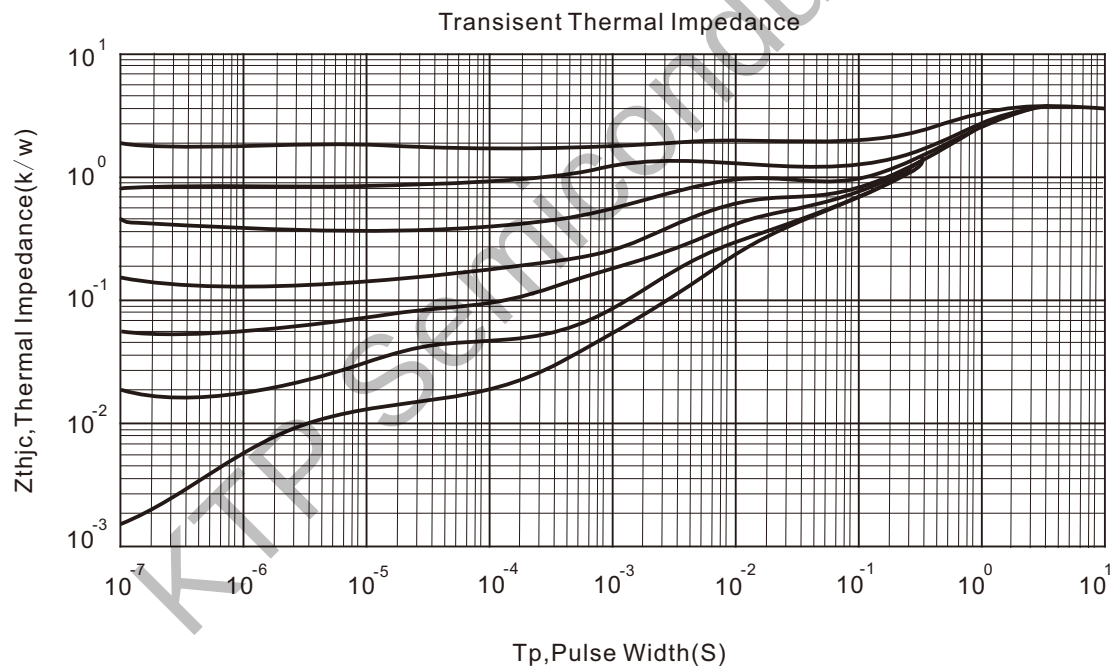
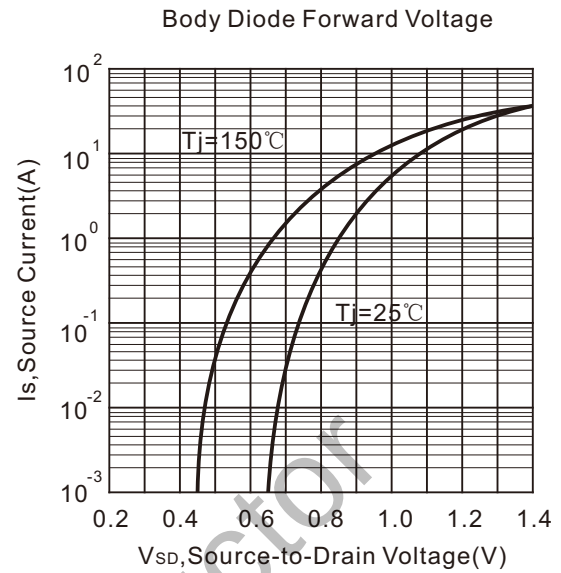
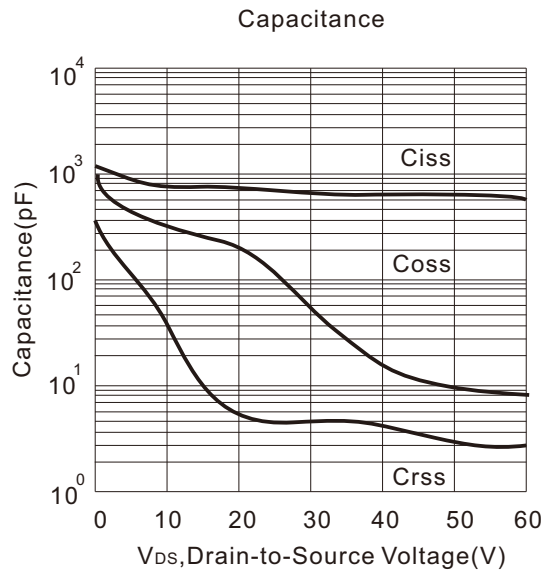
On-Resistance vs. Junction Temperature

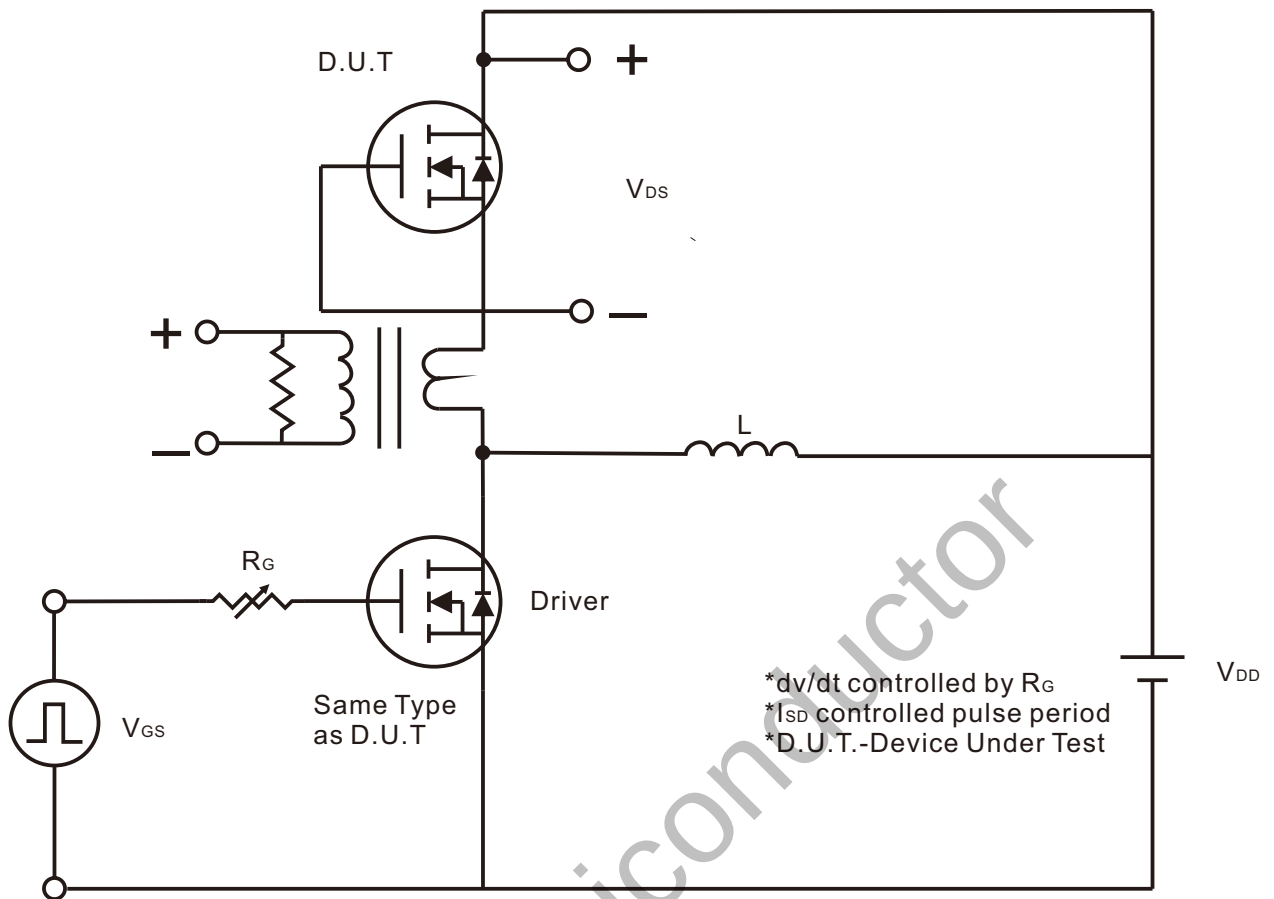


BVDS Variation VS. Temperature

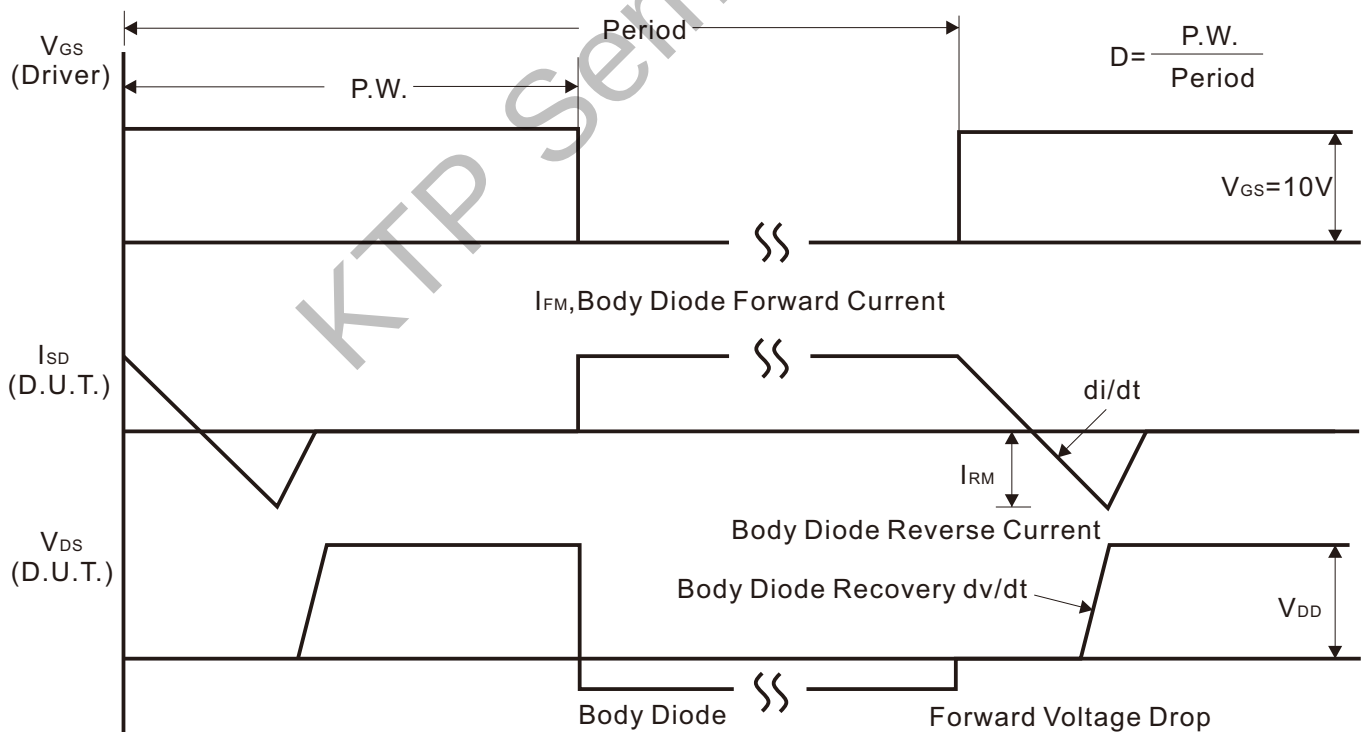


TYPICAL CHARACTERISTICS

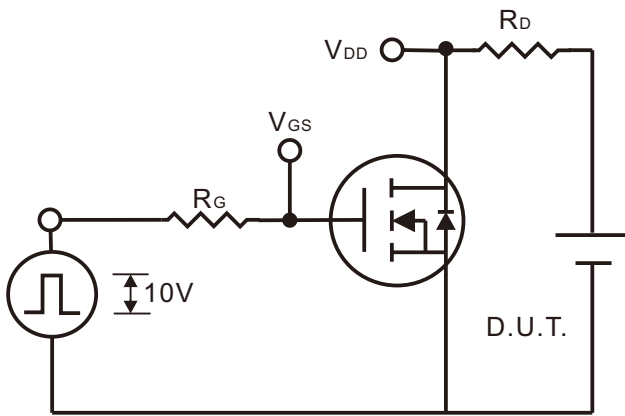




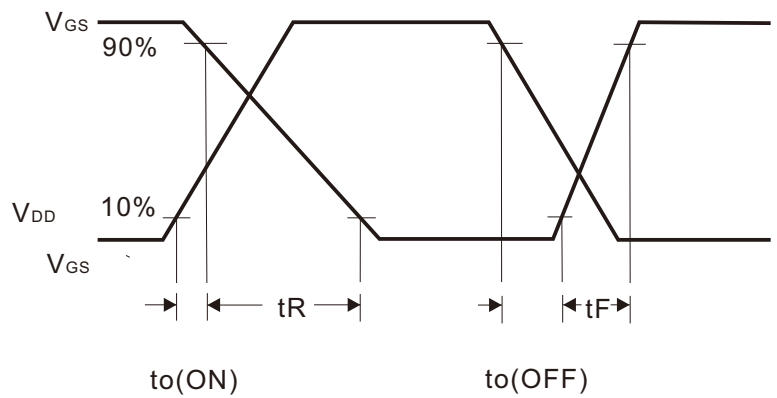
Peak Diode Recovery Test Circuit



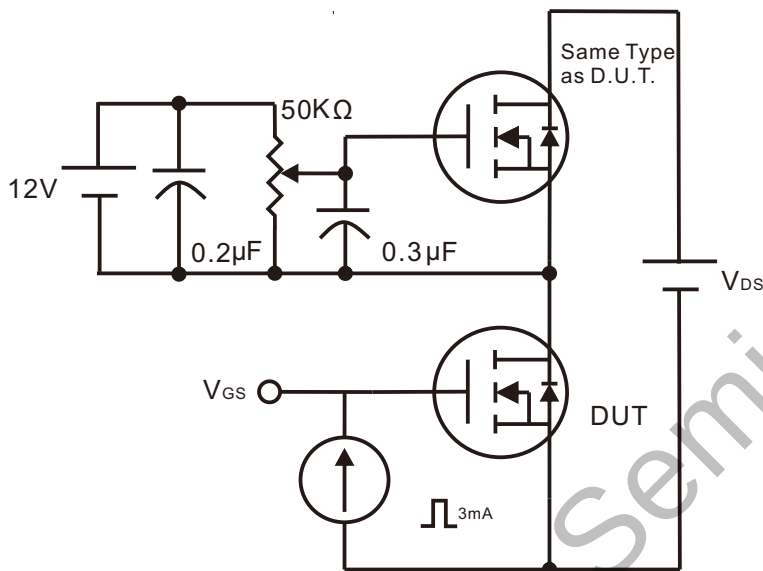
Peak Diode Recovery dv/dt Waveforms



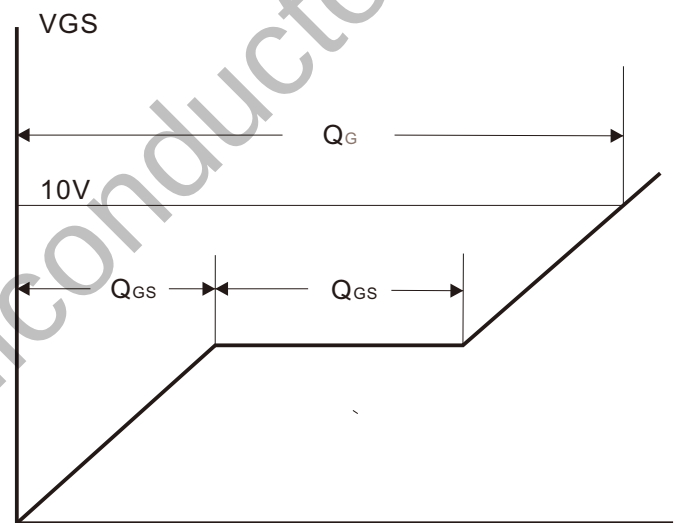
Switching Test Circuit



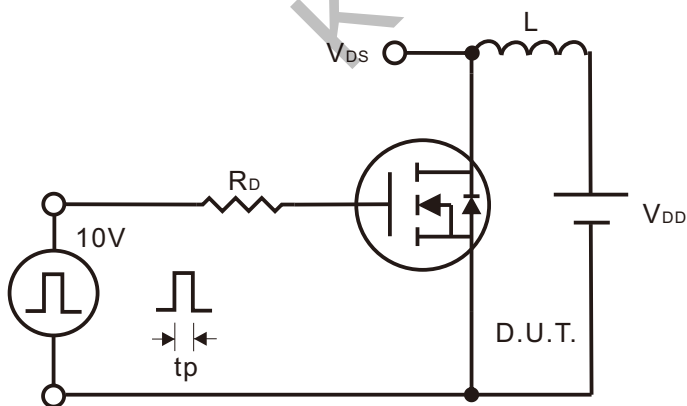
Switching Waveforms



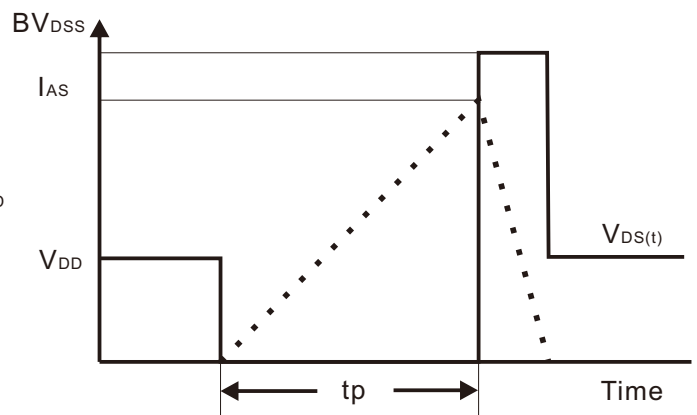
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit

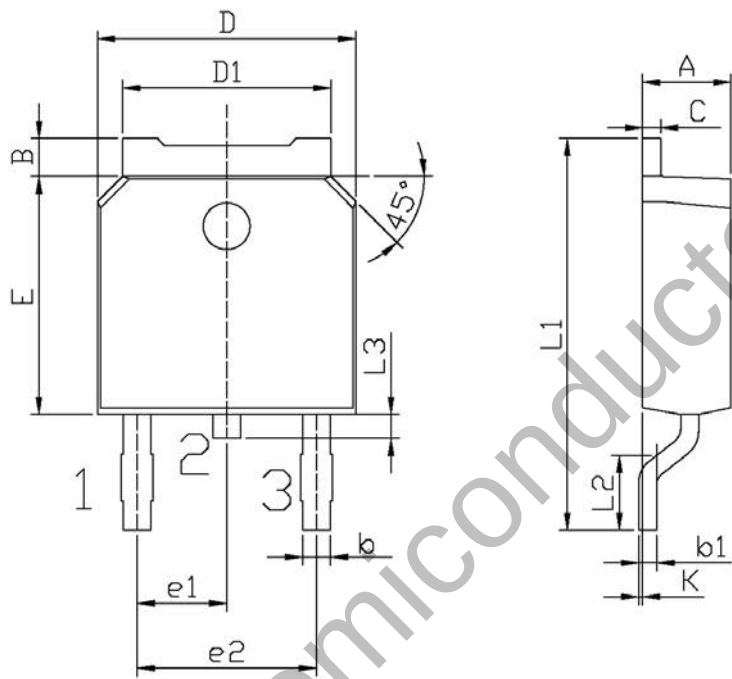


Unclamped Inductive Switching Waveforms

Package Dimension

T0-252

Unit:mm



单位：mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.25	1.75
D	6.45	6.75	L3	0.60	0.90
D1	5.20	5.40	K	0.00	0.10