**DOINGTER**

Description：

This N-Channel MOSFET uses advanced trench technology and

design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features：

1) V_{DS}=150V,I_D=100A,$R_{DS(ON)}$<15m Ω @V_{GS}=10V

2) Low gate charge.

3) Green device available.

4) Advanced high cell denity trench technology for ultra $R_{DS(ON)}$.

5) Excellent package for good heat dissipation.
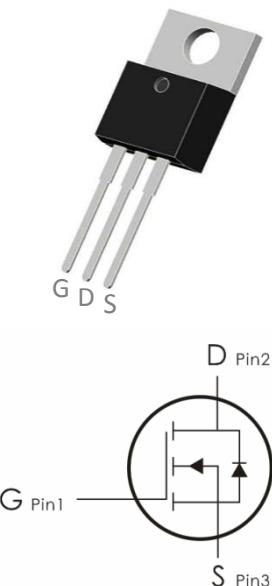
Absolute Maximum Ratings： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	±25	V
I_D	Continuous Drain Current-	100	A
	Continuous Drain Current-TC=100℃	65	
	Pulsed Drain Current	300	
E_{AS}	Single Pulse Avalanche Energy	272	mJ
P_D	Power Dissipation	428	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case[2]	0.29	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	65	

Package Marking and Ordering Information：

Part NO.	Marking	Package
PI015NG	I015N	TO-220

Electrical Characteristics： (T$_C$=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV$_{DSS}$	Drain-Sourtce Breakdown Voltage	V$_{GS}$=0V,I$_D$=250 μA	150	---	---	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{GS}$=0V, V$_{DS}$=150V,Tj=25℃	---	0.05	1	μA
		V$_{GS}$=0V, V$_{DS}$=150V,Tj=150℃	---	---	20	μA
I$_{GSS}$	Gate-Source Leakage Current	V$_{GS}$=±20V, V$_{DS}$=0A	---	10	100	nA
On Characteristics						
V$_{GS(th)}$	GATE-Source Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$=250 μA	3	4	5	V
R$_{DS(ON)}$	Drain-Source On Resistance	V$_{GS}$=10V,I$_D$=50A	---	10	15	mΩ
		V$_{GS}$=4.5V,I$_D$=A	---	22	27	
G$_{FS}$	Forward Transconductance	V$_{DS}$=25V, I$_D$=30A	---	101	---	S
Dynamic Characteristics						
C$_{iss}$	Input Capacitance	V$_{DS}$=75V, V$_{GS}$=0V, f=1MHz	---	3593	---	pF
C$_{oss}$	Output Capacitance		---	331	---	
C$_{rss}$	Reverse Transfer Capacitance		---	92	---	
Switching Characteristics						
t$_{d(on)}$	Turn-On Delay Time	V$_{DD}$=30V, I$_D$=2A, R$_{GEN}$=2.5Ω .V$_{GS}$=10V	---	18	---	ns
t$_r$	Rise Time		---	93	---	ns
t$_{d(off)}$	Turn-Off Delay Time		---	34	---	ns
t$_f$	Fall Time		---	70	---	ns
R$_g$	Gate resistance	V$_{GS}$=0V, V$_{DS}$=0V, f=1MHz	---	1.7	---	Ω
Q$_g$	Total Gate Charge	V$_{GS}$=10V, V$_{DS}$=30V, I$_D$=30A	---	69	---	nC
Q$_{gs}$	Gate-Source Charge		---	24	---	nC
Q$_{gd}$	Gate-Drain "Miller" Charge		---	26	---	nC

Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=50A$	---	0.9	1.3	V
Trr	Reverse Recovery Time	$I_F=50A, dI/dt=100A/\mu s$	---	70	---	NS
Qrr	Reverse Recovery Charge		---	233	---	NC

Typical Characteristics： $(T_C=25℃$ unless otherwise noted)

### Fig 1: Output Characteristics
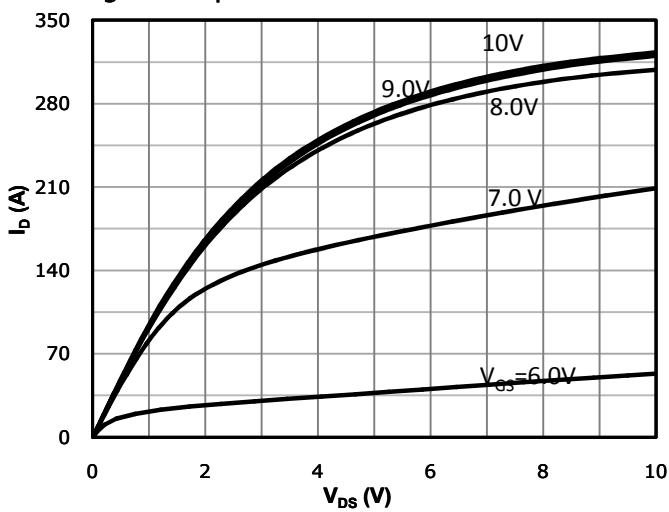
Fig 2: Transfer Characteristics
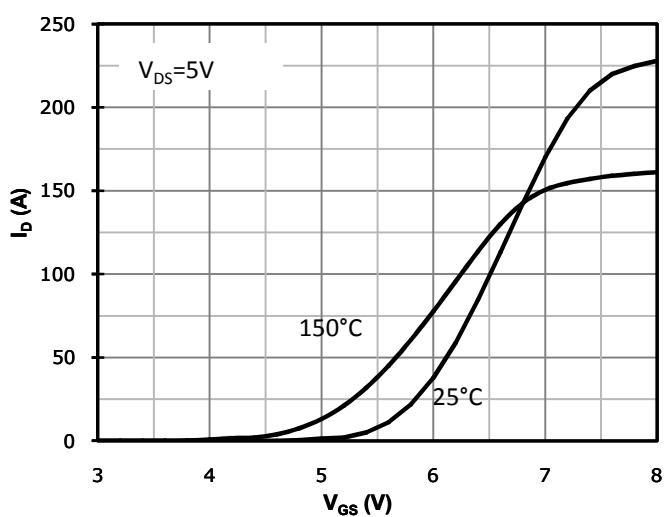
Fig 3: Rds(on) vs Drain Current and Gate Voltage
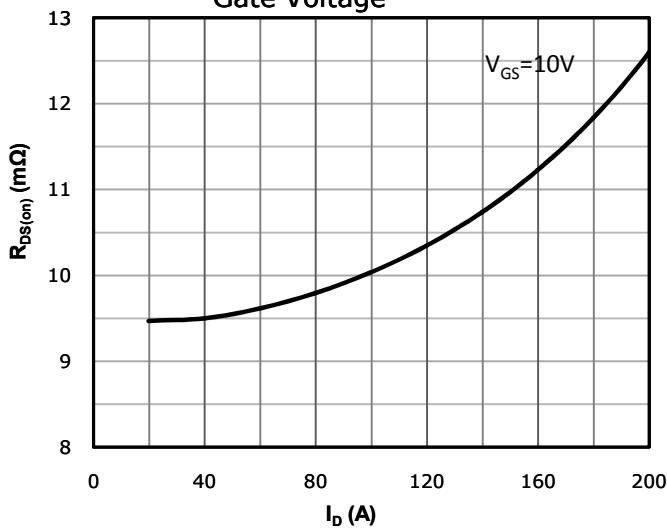
Fig 4: Rds(on) vs Gate Voltage

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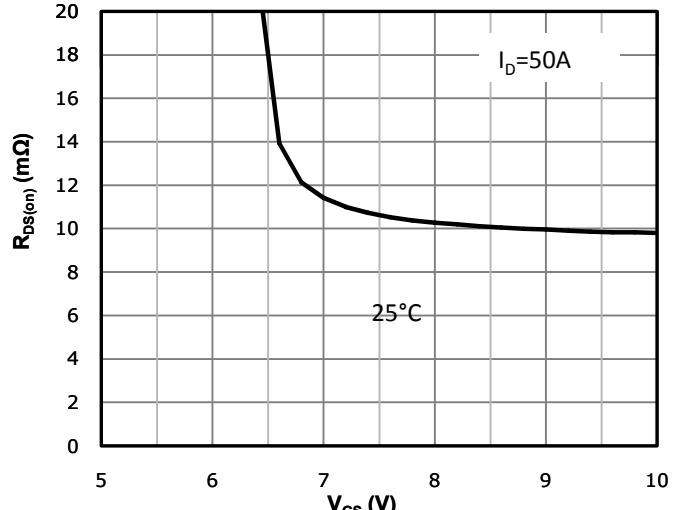
Fig 5: Rds(on) vs. Temperature

V_{GS}=10V
I_D=50A

X-axis: Tj - Junction Temperature (°C)
Y-axis: $R_{DS(on)}$ Normalized
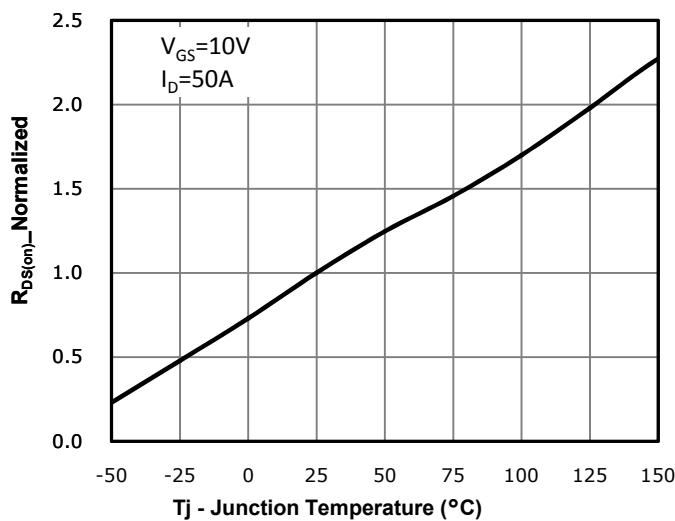
Fig 6: Capacitance Characteristics

Ciss
Coss
Crss

V_{GS}=0V
f=1MHz

X-axis: V_{DS} (V)
Y-axis: - Capacitance (PF)
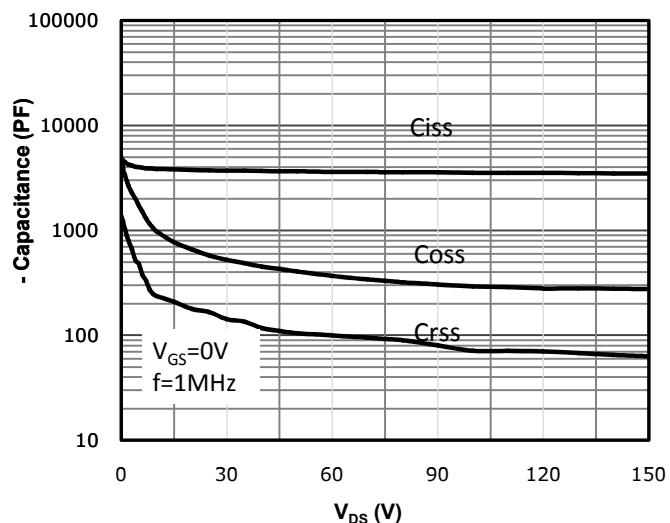
Fig 7: Gate Charge Characteristics

V_{DS}=75V
I_D=50A

X-axis: Qg (nC)
Y-axis: V_{GS} (V)
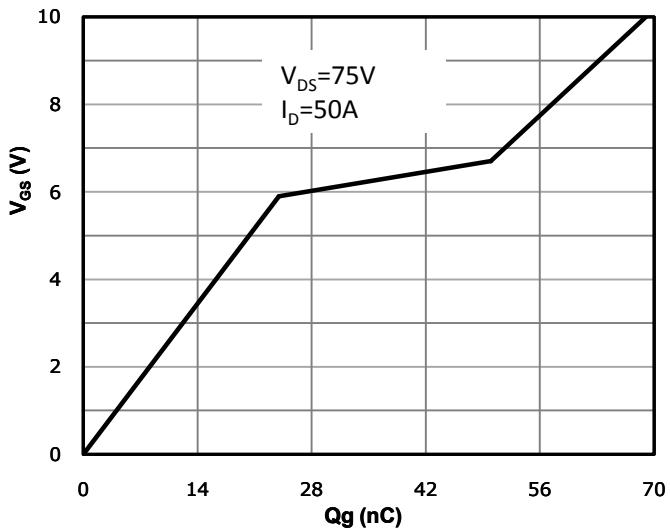
Fig 8: Body-diode Forward Characteristics

150°C
25°C

X-axis: V_{SD} - Diode Forward Voltage(V)
Y-axis: I_S - Diode Current(A)

Fig 9: Power Dissipation

X-axis: Tc - Case Temperature (°C)
Y-axis: P_{tot} (W)
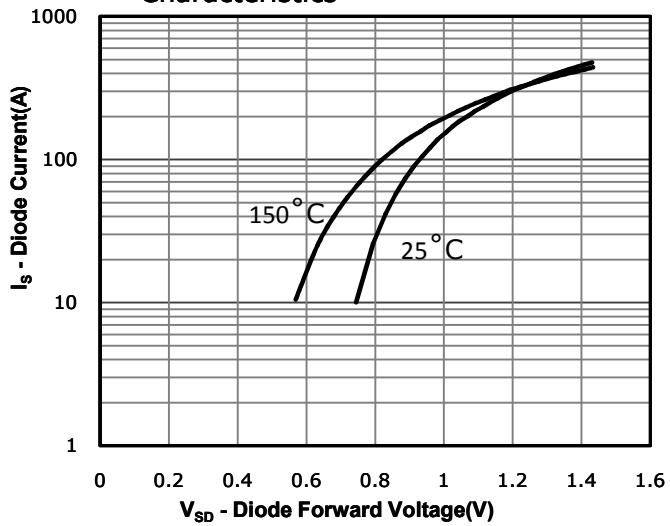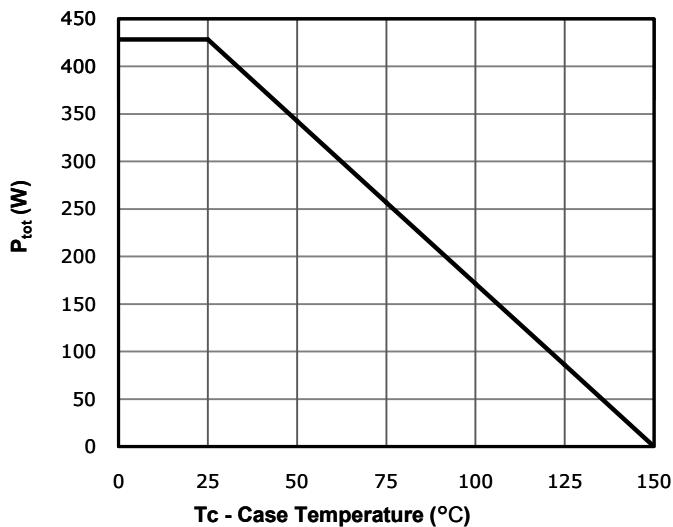
Fig 10: Drain Current Derating

V_{GS}≥10V

X-axis: Tc - Case Temperature (°C)
Y-axis: I_D (A)
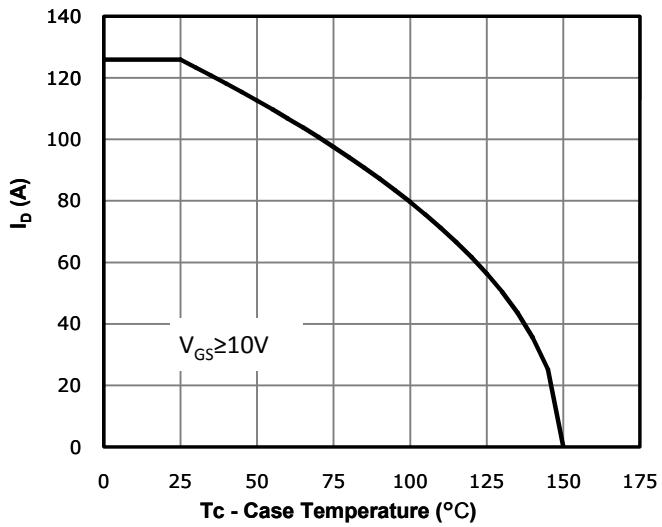
Fig 11: Safe Operating Area
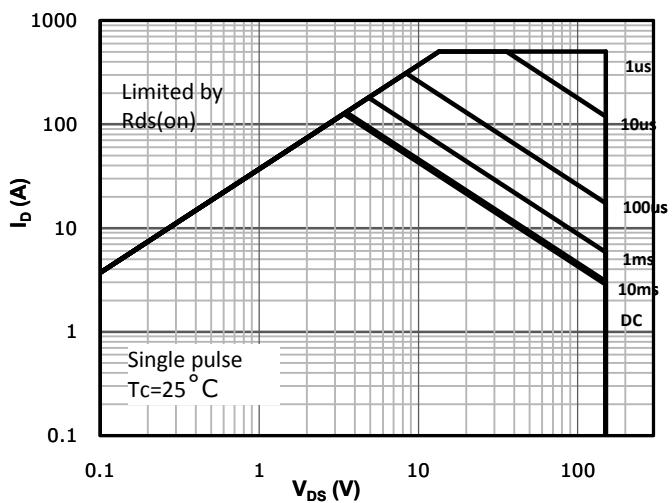
Fig 12: Max. Transient Thermal Impedance

Duty factor D=t1/t2

$T_{JM}-T_C=P_{DM}*Z_{thJC}(t)$
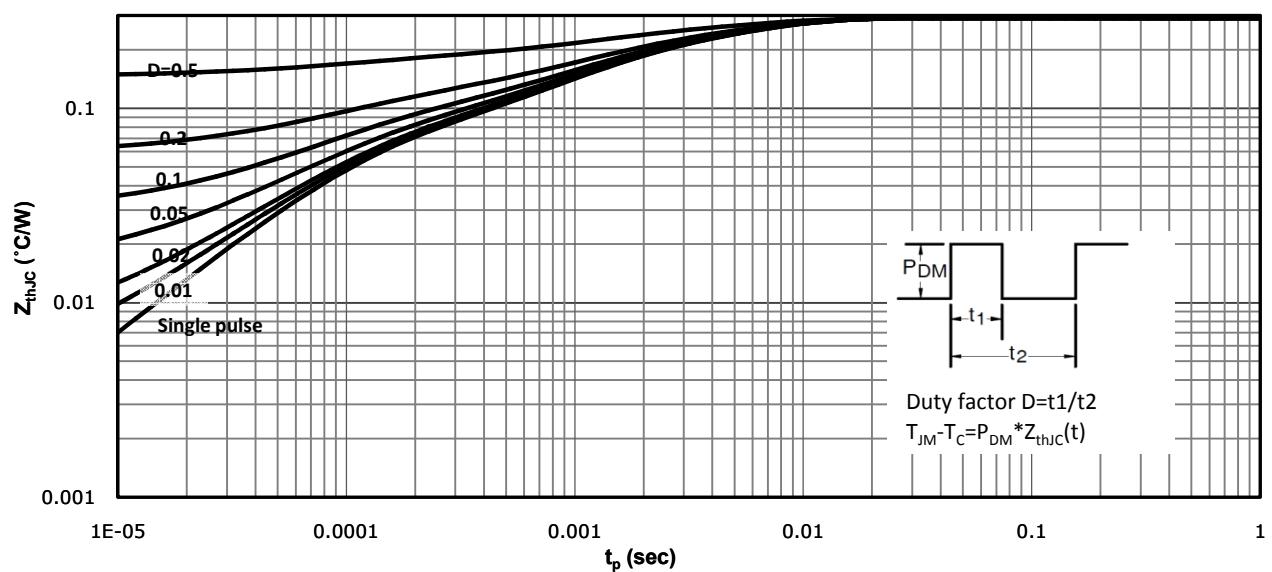
est Circuit & Waveform

Gate Charge Test Circuit & Waveform
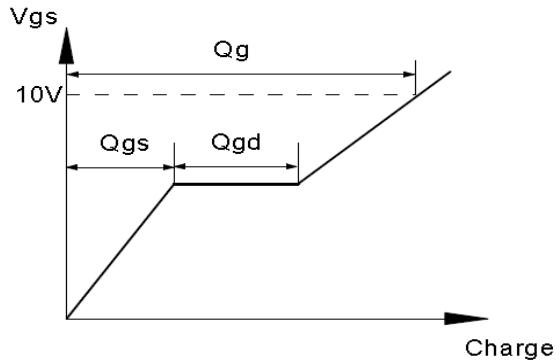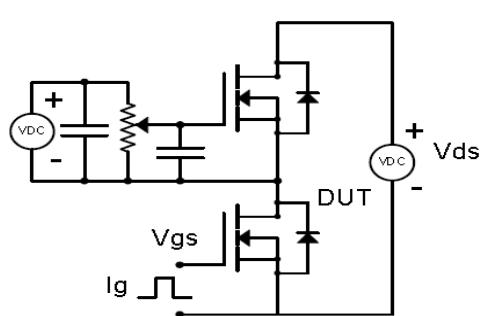
Resistive Switching Test Circuit & Waveforms
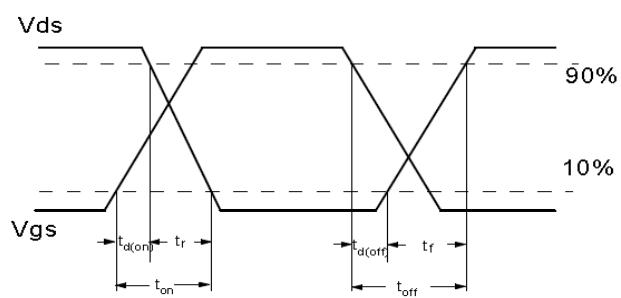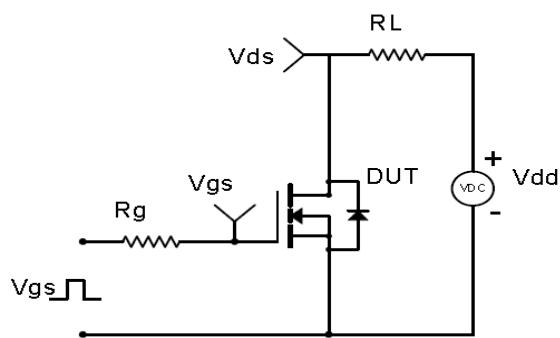
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

$$E_{AR} = 1/2\ LI_{AR}^2$$
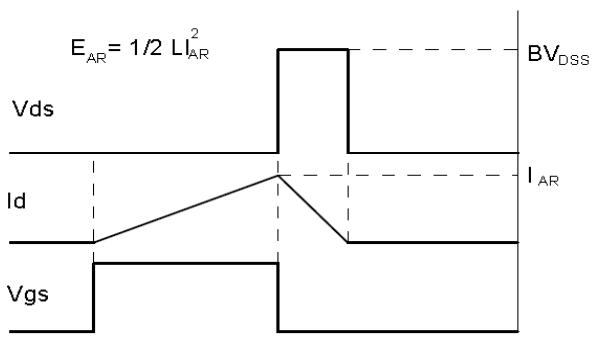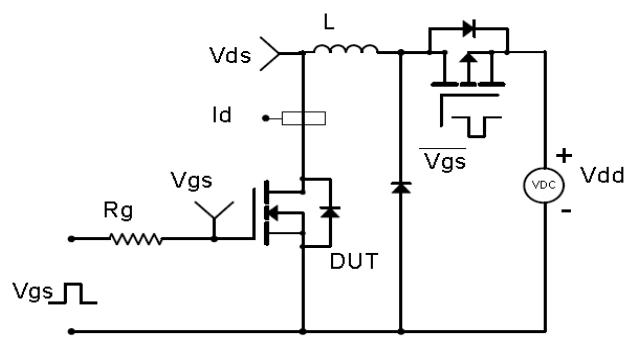
Diode Recovery Test Circuit & Waveforms

$$Q_{rr} = \int I dt$$
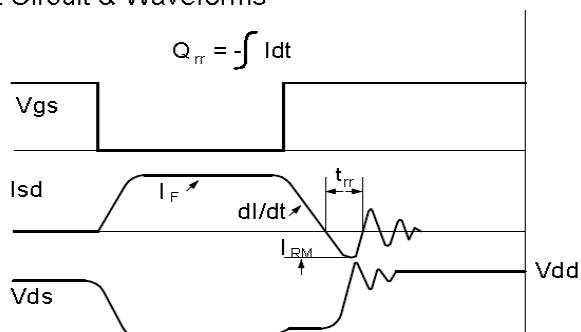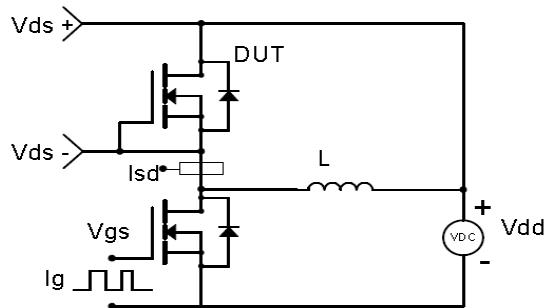
Package Outline: TO-220-3L
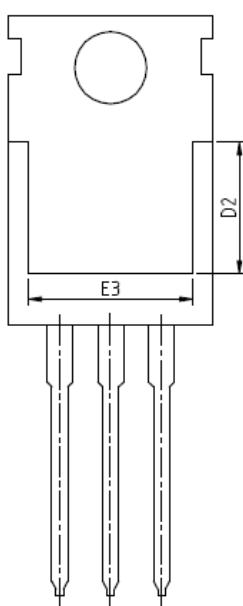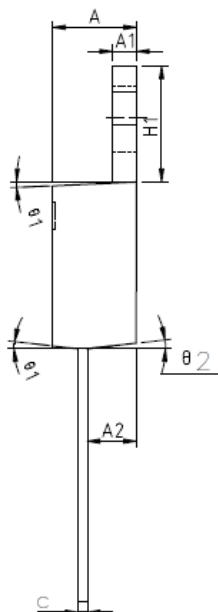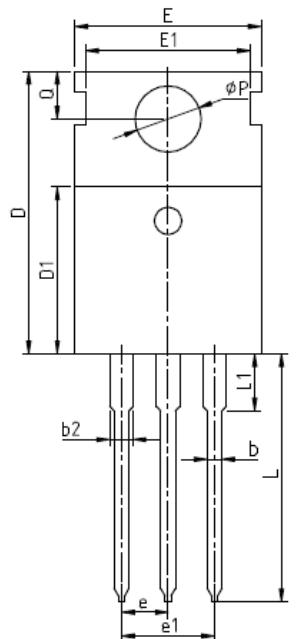
SYMBOL	MIN	NOM	MAX
A	4.27	4.57	4.87
A1	1.15	1.30	1.45
A2	2.10	2.40	2.70
b	0.70	0.80	1.00
b2	1.17	1.27	1.50
c	0.40	0.50	0.65
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.70	6.70	7.00
E	9.70	10.00	10.30
E1	–	8.70	–
E2	9.65	10.00	10.35
E3	7.00	8.00	8.40
e		2.54 BSC	
e1		5.08 BSC	
H1	6.00	6.50	6.85
L	12.75	13.50	13.90
L1	–	3.10	3.40
ΦP	3.45	3.60	3.75
Q	2.60	2.80	3.00
θ1	4°	7°	10°
θ2	0°	3°	6°