

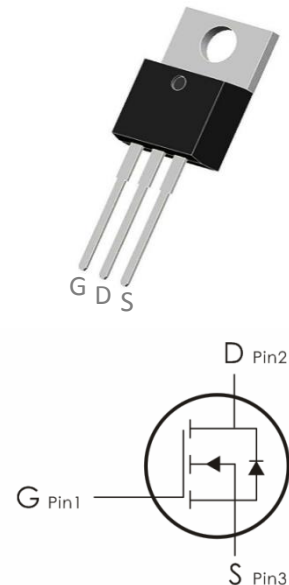
Description:

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) $V_{DS}=150V, I_D=100A, R_{DS(on)} < 15m\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ 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- $T_C=100^\circ C$	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	$^\circ C$

Thermal Characteristics:

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

Package Marking and Ordering Information:

Part NO.	Marking	Package
PI015NG	I015N	TO-220

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V,I _D =250 μ A	150	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =150V,Tj=25 °C	---	0.05	1	μ A
		V _{GS} =0V, V _{DS} =150V,Tj=150 °C	---	---	20	μ A
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 μ A	3	4	5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V,I _D =50A	---	10	15	m Ω
		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} =2.5 Ω .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
T_{rr}	Reverse Recovery Time	I _F =50A, dI/dt=100A/μs	---	70	---	NS
Q_{rr}	Reverse Recovery Charge	S	---	233	---	NC

Typical Characteristics: (T_C=25°C unless otherwise noted)

Fig 1: Output Characteristics

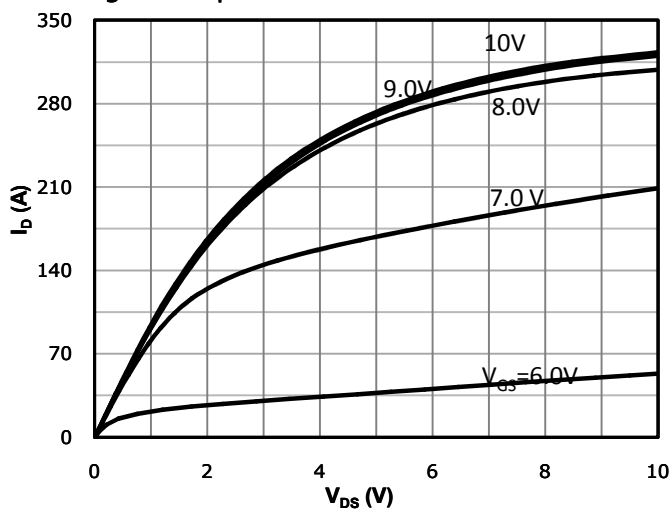


Fig 2: Transfer Characteristics

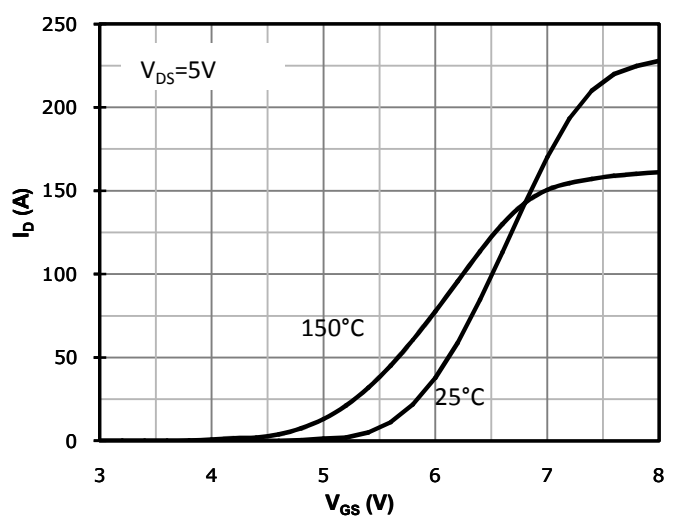


Fig 3: Rds(on) vs Drain Current and Gate Voltage

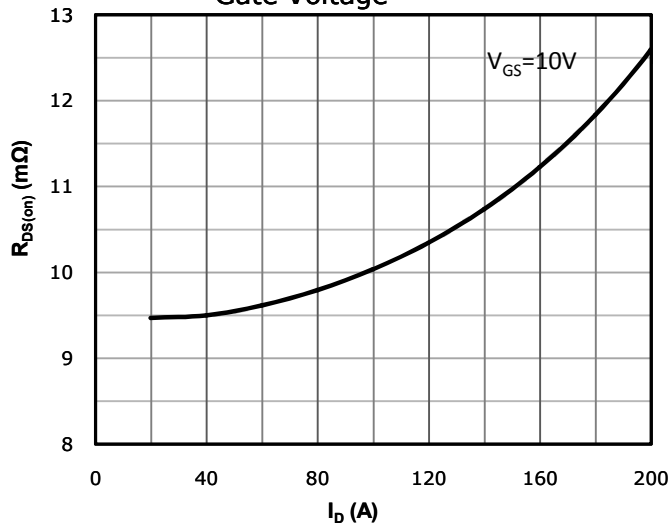


Fig 4: Rds(on) vs Gate Voltage

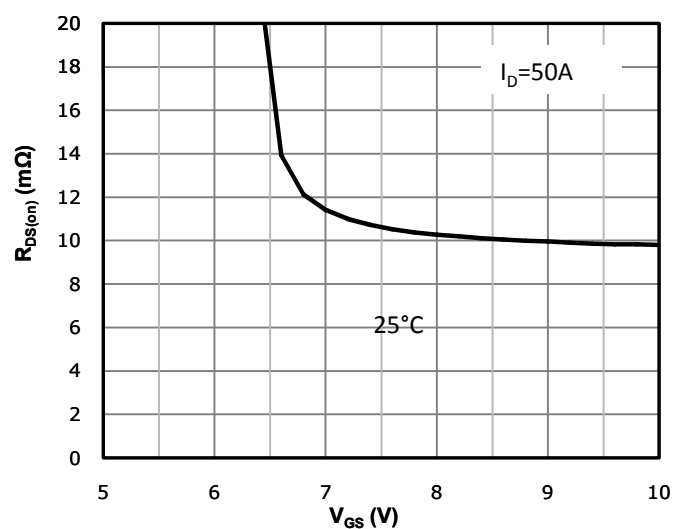


Fig 5: $R_{DS(on)}$ vs. Temperature

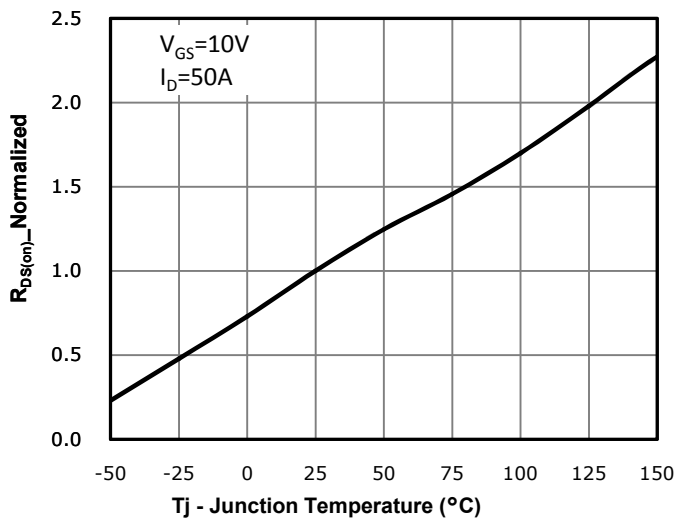


Fig 6: Capacitance Characteristics

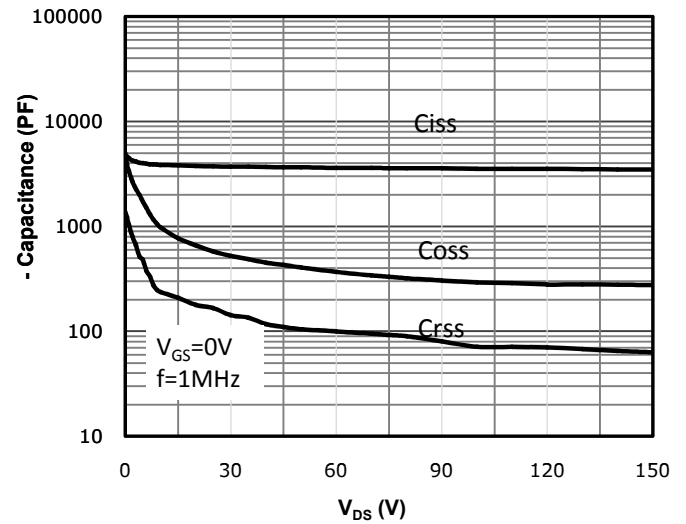


Fig 7: Gate Charge Characteristics

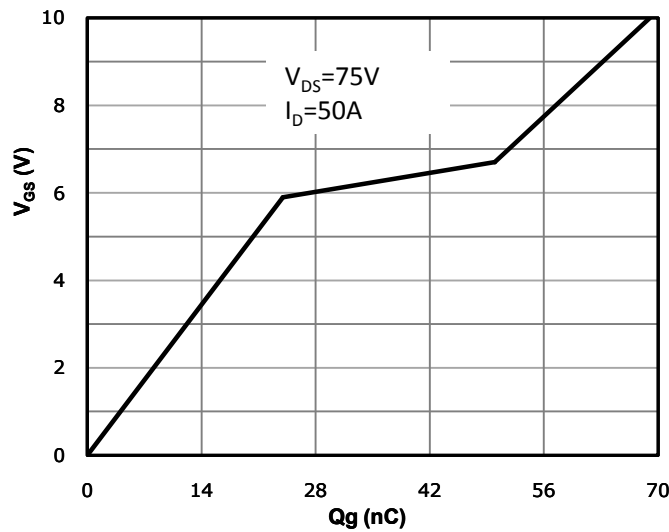


Fig 8: Body-diode Forward Characteristics

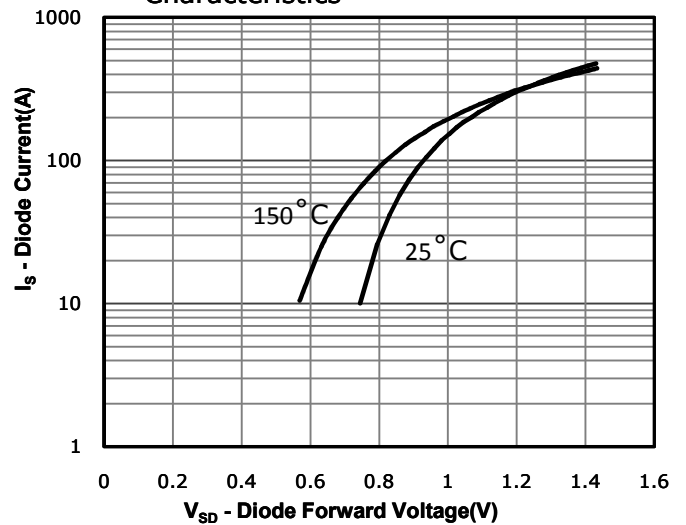


Fig 9: Power Dissipation

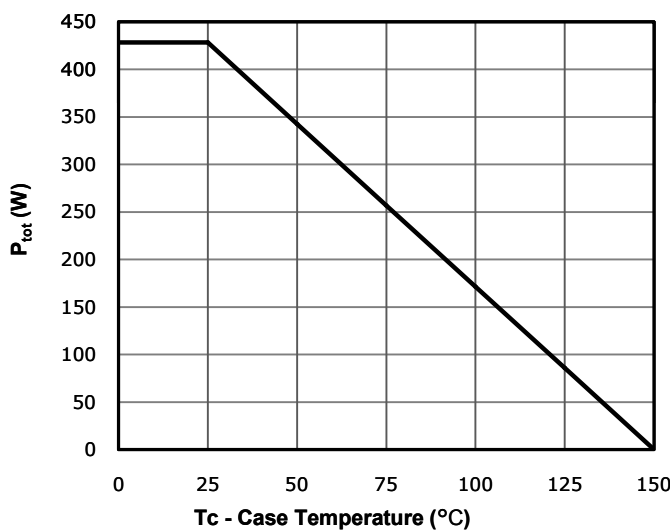


Fig 10: Drain Current Derating

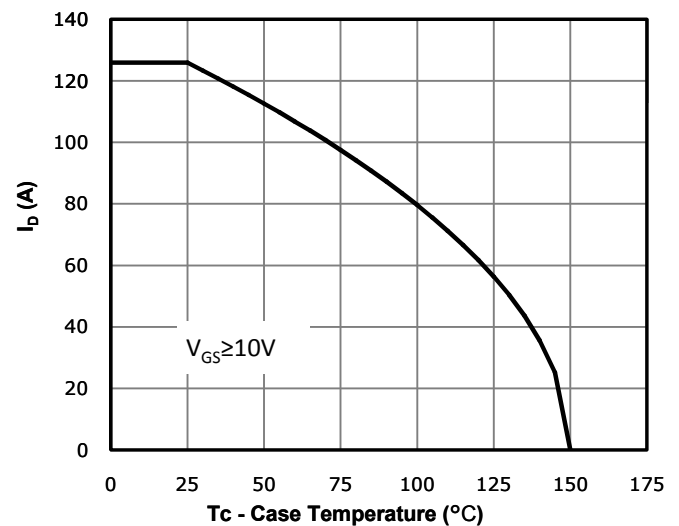


Fig 11: Safe Operating Area

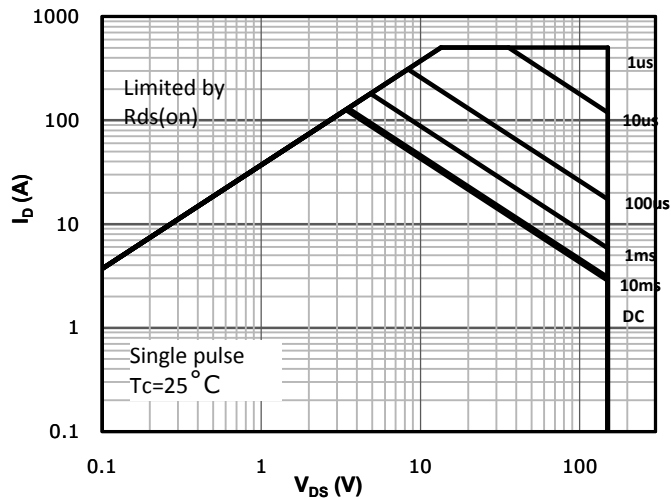
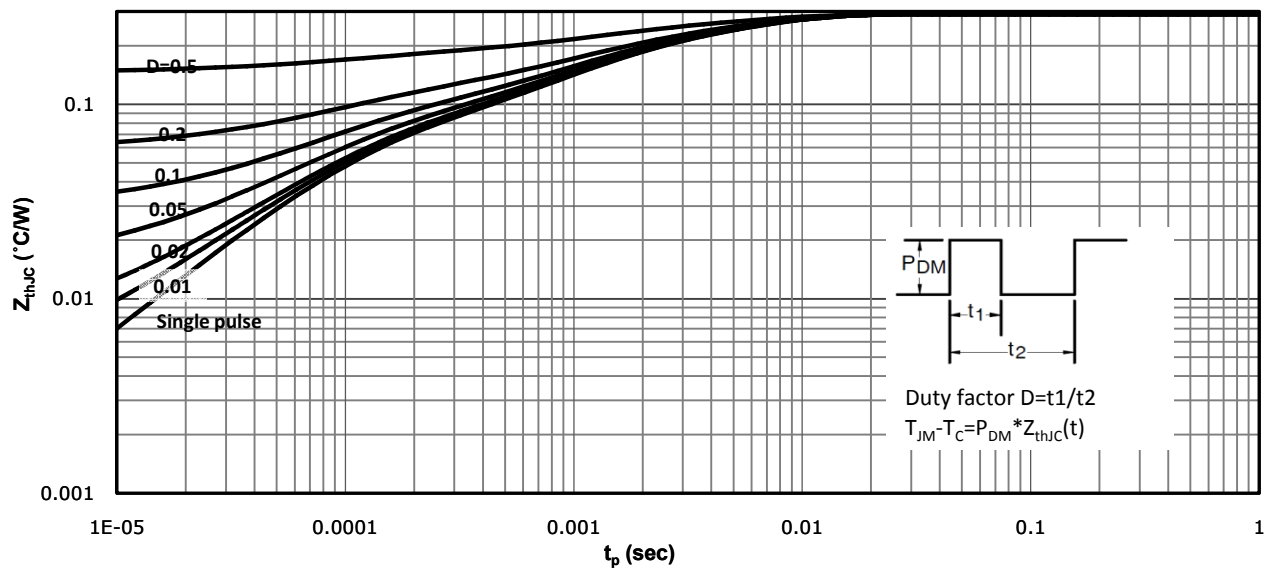
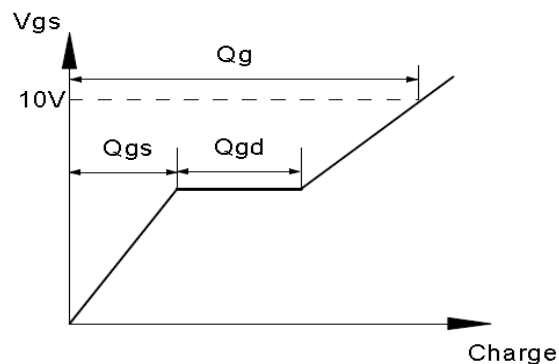
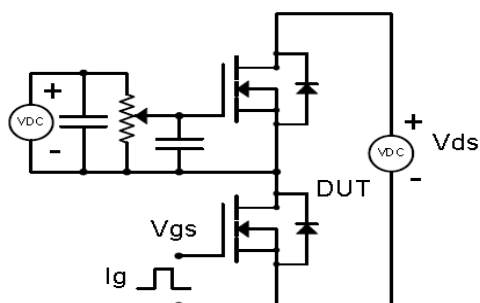


Fig 12: Max. Transient Thermal Impedance

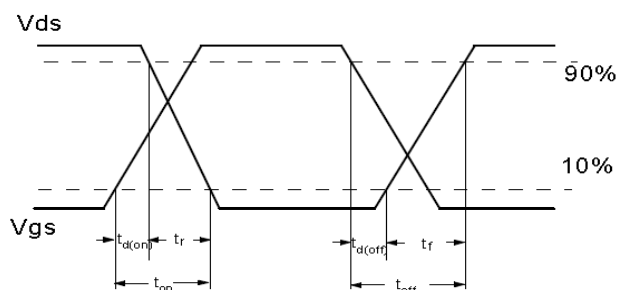
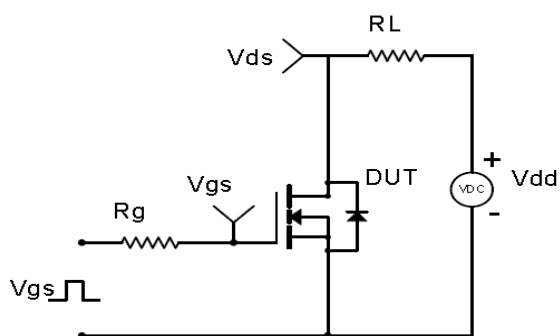


Test Circuit & Waveform

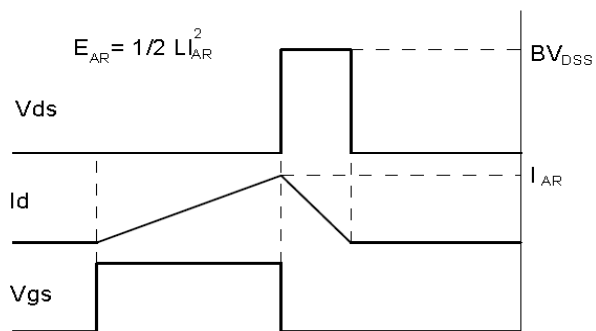
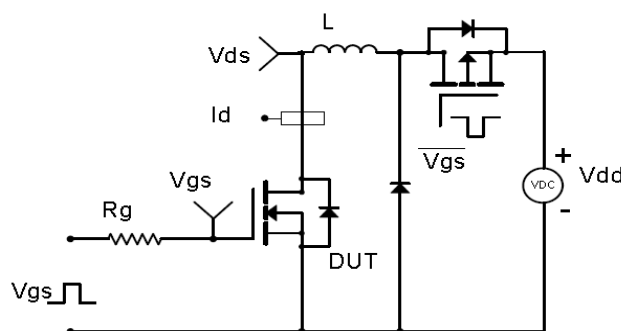
Gate Charge Test Circuit & Waveform



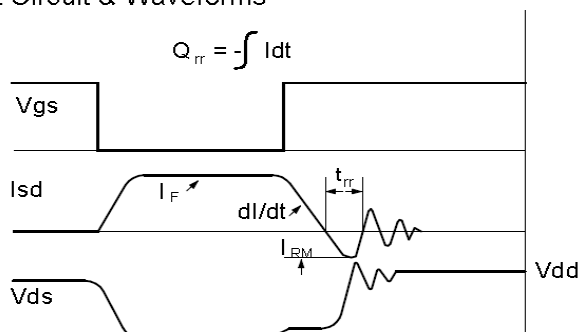
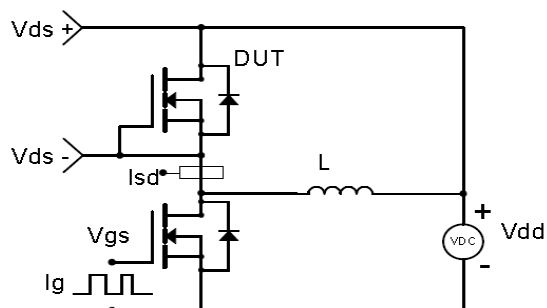
Resistive Switching Test Circuit & Waveforms



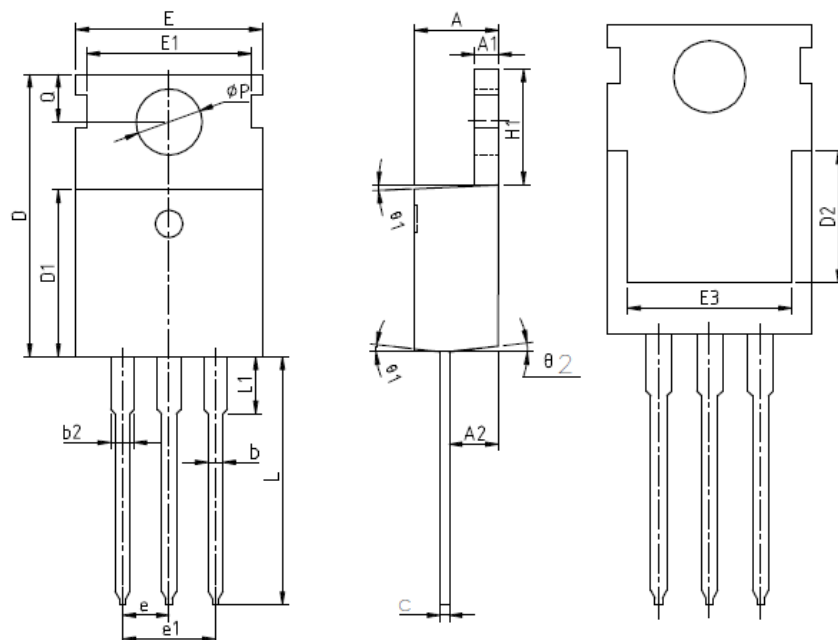
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



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
θ 1	4°	7°	10°
θ 2	0°	3°	6°



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