



Features

- Uses CRM(CQ) advanced Trench MOS technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

Applications

- Motor control and drive
- Battery management
- UPS (Uninterruptible Power Supplies)

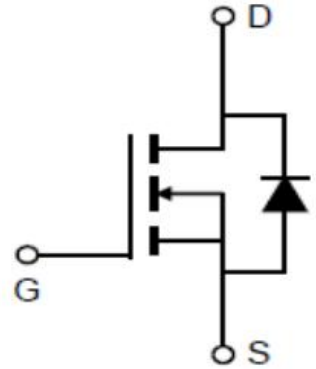
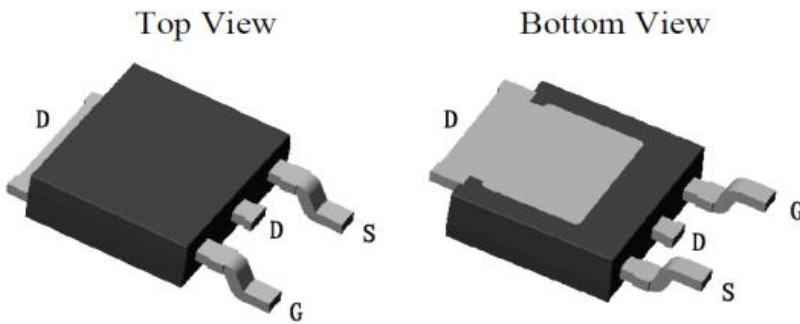
Product Summary

V_{DS}	100V
$R_{DS(on)}$ typ.	32m Ω
I_D	30A

100% DVDS Tested

100% Avalanche Tested

TO-252



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
30N10	30N10	TO-252	Reel	N/A	N/A	2500pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	100	V
Continuous drain current $T_C = 25^\circ\text{C}$ (Silicon limit) $T_C = 25^\circ\text{C}$ (Package limit) $T_C = 100^\circ\text{C}$ (Silicon limit)	I_D	30 80 12	A
Pulsed drain current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	$I_{D\ pulse}$	104	A
Avalanche energy, single pulse ($L=0.5\text{mH}$, $R_g=25\Omega$)	E_{AS}	30	mJ
Gate-Source voltage	V_{GS}	± 20	V
Power dissipation ($T_C = 25^\circ\text{C}$)	P_{tot}	58	W
Operating junction and storage temperature	T_j, T_{stg}	-55...+150	$^\circ\text{C}$



Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	1.69	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	102	

Electrical Characteristic (at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

Static Characteristic

Drain-source breakdown voltage	BV_{DSS}	100	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	1.3	1.7	2	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	0.05	1	μA	$V_{DS}=100V, V_{GS}=0V$ $T_j=25^\circ C$
		-	-	5		$T_j=125^\circ C$
Gate-source leakage current	I_{GSS}	-	10	100	nA	$V_{GS}=20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	32	38.0	m Ω	$V_{GS}=10V, I_D=12A,$ $T_j=25^\circ C$
		-	58	70.0		$T_j=125^\circ C$
		-	36	45.0		$V_{GS}=4.5V, I_D=10A,$
Transconductance	g_{fs}	-	48	-	S	$V_{DS}=5V, I_D=12A$

Dynamic Characteristic

Input Capacitance	C_{iss}	-	3568	-	pF	$V_{GS}=0V, V_{DS}=50V,$ $f=1MHz$
Output Capacitance	C_{oss}	-	109	-		
Reverse Transfer Capacitance	C_{rss}	-	88	-		
Gate Total Charge	Q_G	-	65	-	nC	$V_{GS}=10V, V_{DS}=50V,$ $I_D=20A, f=1MHz$
Gate-Source charge	Q_{gs}	-	6.7	-		
Gate-Drain charge	Q_{gd}	-	18	-		
Turn-on delay time	$t_{d(on)}$	-	13	-	ns	$V_{GS}=10V, V_{DD}=50V,$ $R_{G_ext}=3\Omega, I_D=12A,$
Rise time	t_r	-	28	-		
Turn-off delay time	$t_{d(off)}$	-	79	-		
Fall time	t_f	-	18	-		



30N10 (文件编号: S&CIC1768)

N-channel enhancement mode MOSFET

Gate resistance	R_G	-	1.3	-	Ω	$V_{GS}=0V, V_{DS}=0V,$ $f=1MHz$
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Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.8	1.3	V	$V_{GS}=0V, I_{SD}=30A$
Body Diode Reverse Recovery Time	t_{rr}	-	49	-	ns	$I_F=12A, dI/dt=100A/\mu$ s
Body Diode Reverse Recovery Charge	Q_{rr}	-	73	-	nC	



Typical Performance Characteristics

Fig 1: Output Characteristics

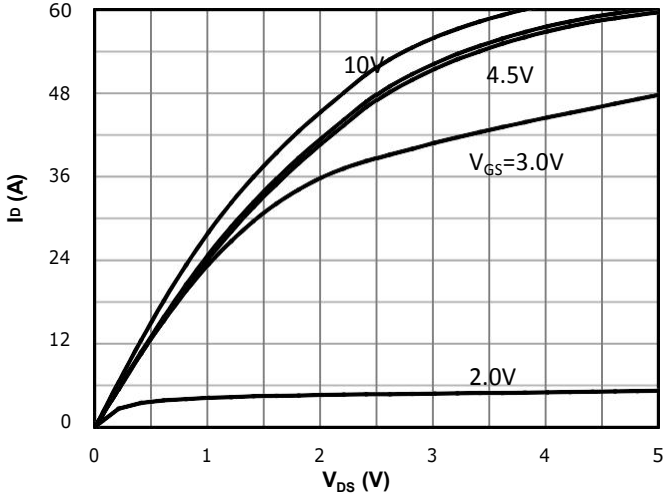


Fig 2: Transfer Characteristics

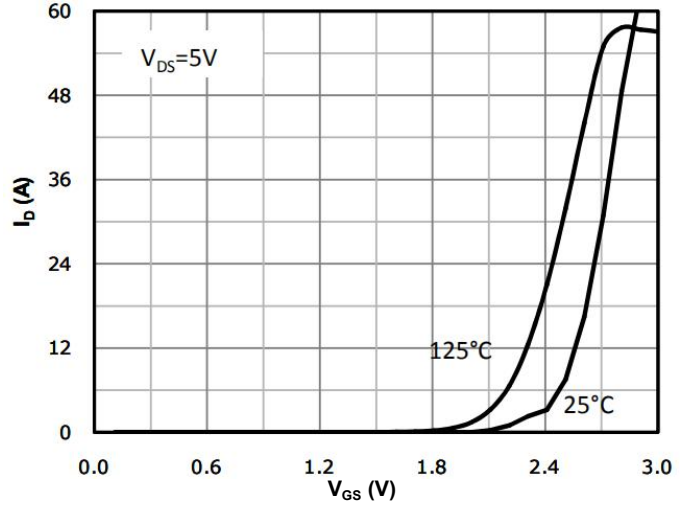


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

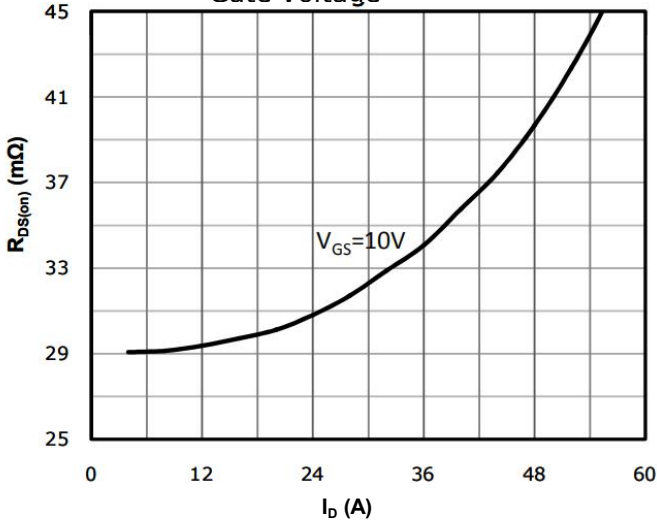


Fig 4: $R_{DS(on)}$ vs Gate Voltage

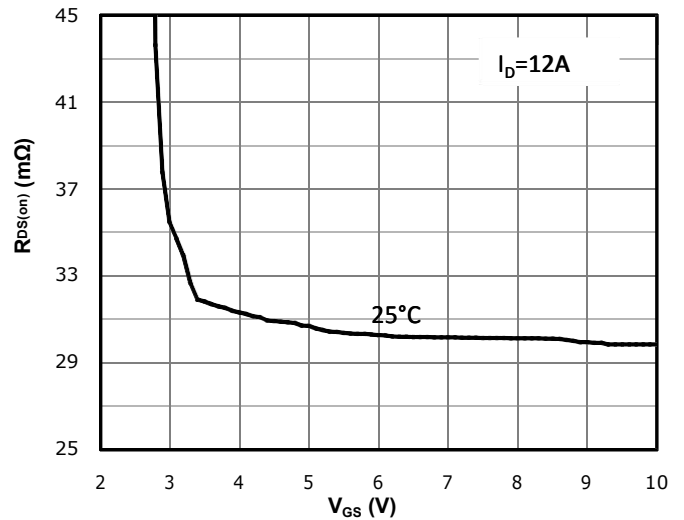


Fig 5: $R_{DS(on)}$ vs Temperature

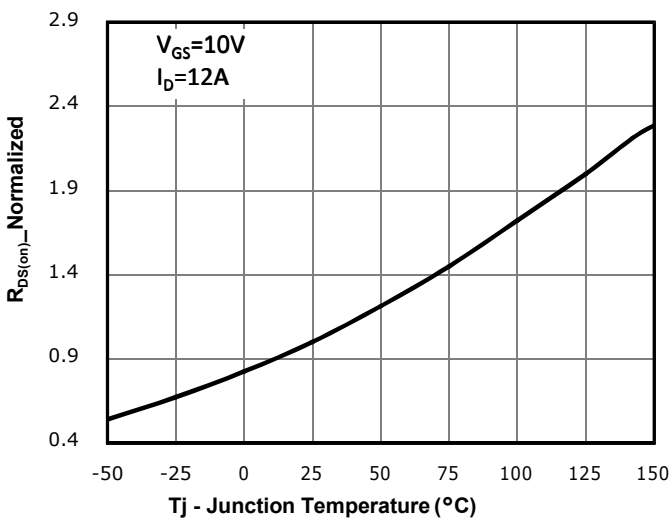


Fig 6: Capacitance Characteristics

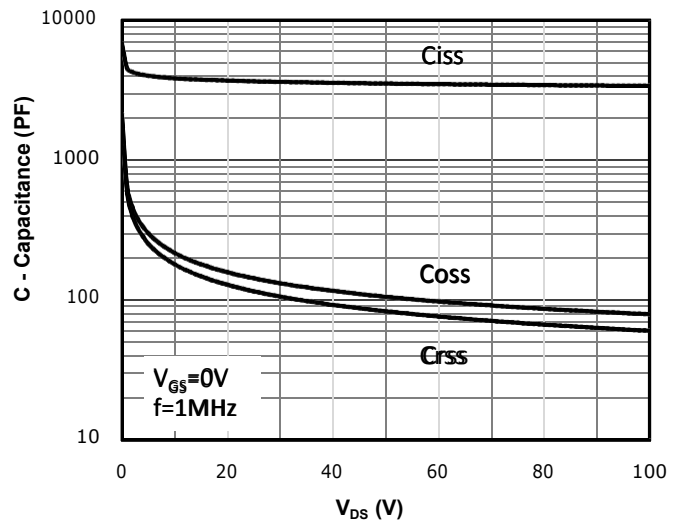




Fig 7: Gate Charge Characteristics

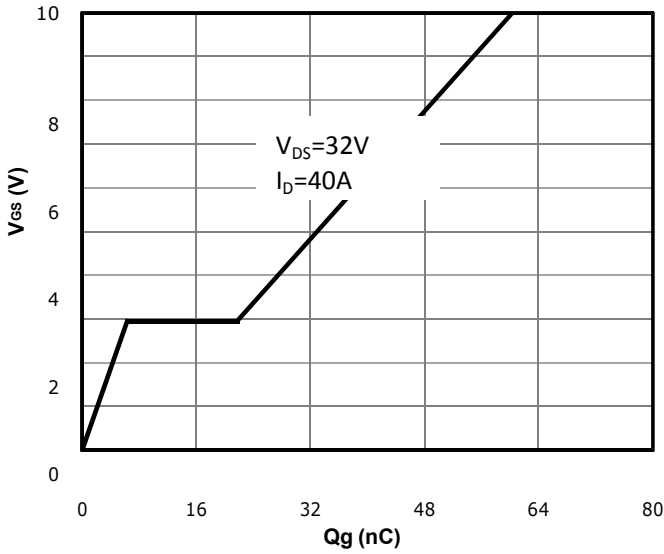


Fig 8: Body-diode Forward Characteristics

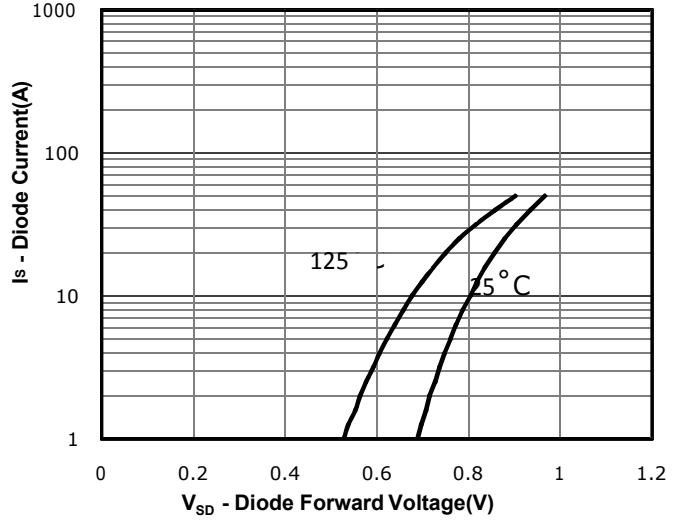


Fig 9: Power Dissipation

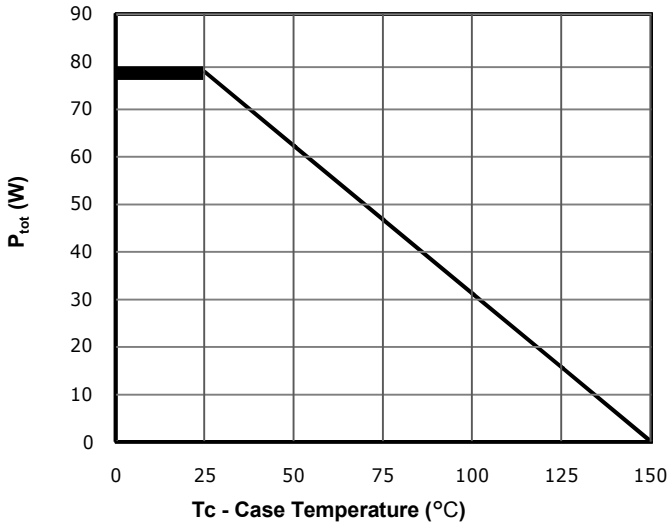


Fig 10: Drain Current Derating

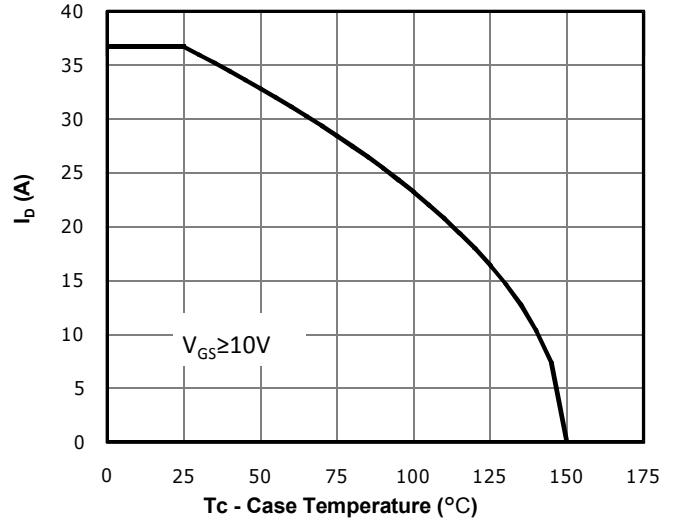


Fig 11: Safe Operating Area

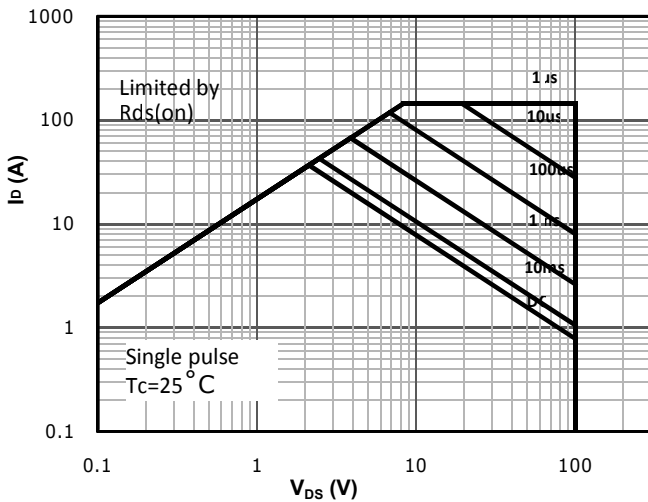
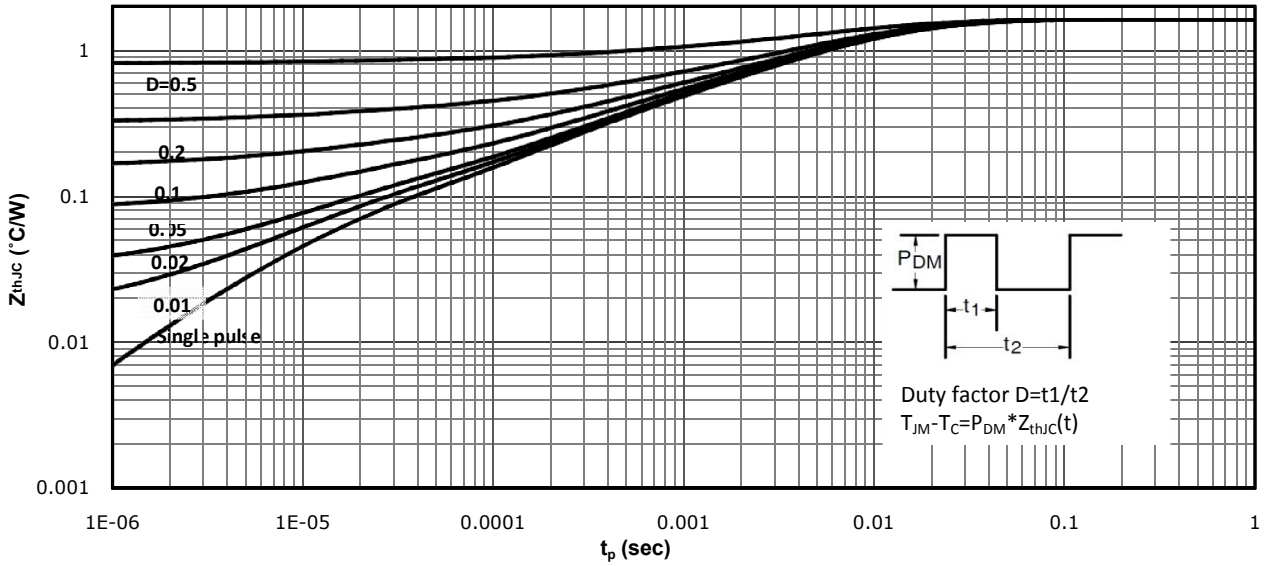




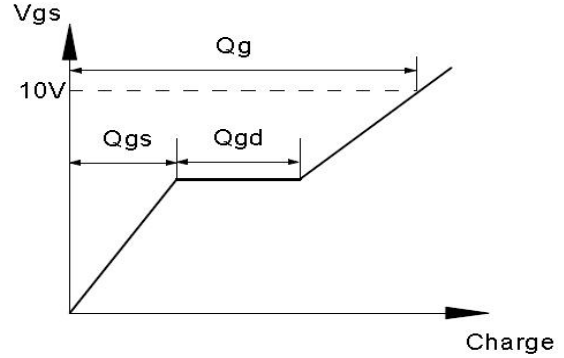
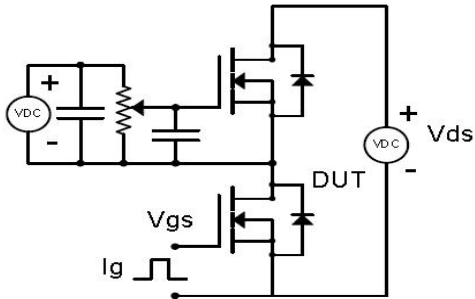
Fig 12: Max. Transient Thermal Impedance



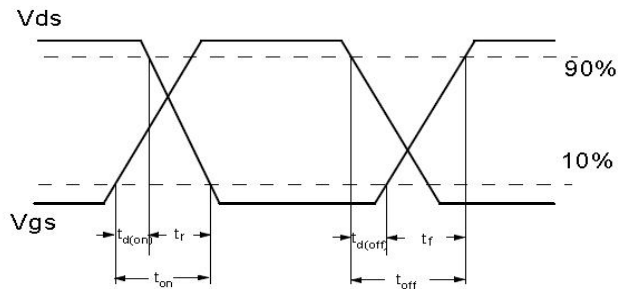
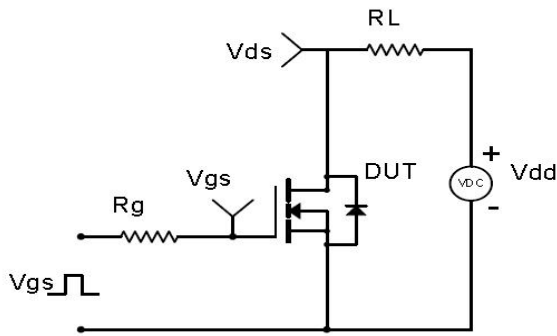


Test Circuit & Waveform

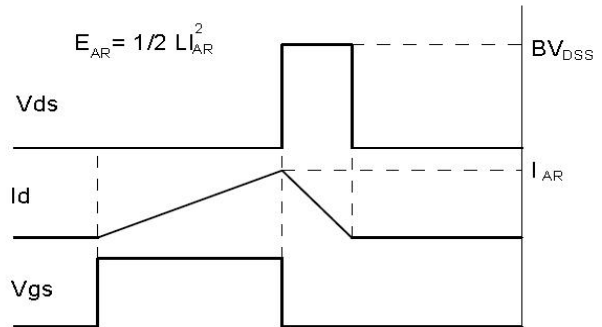
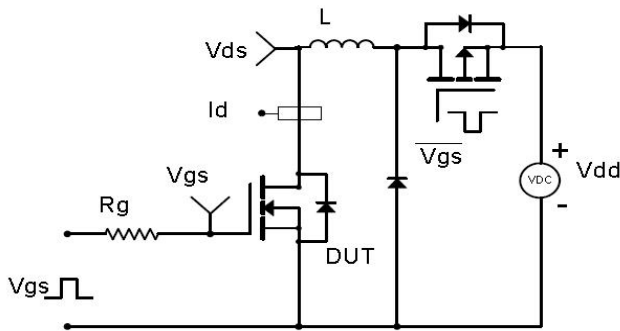
Gate Charge Test Circuit & Waveform



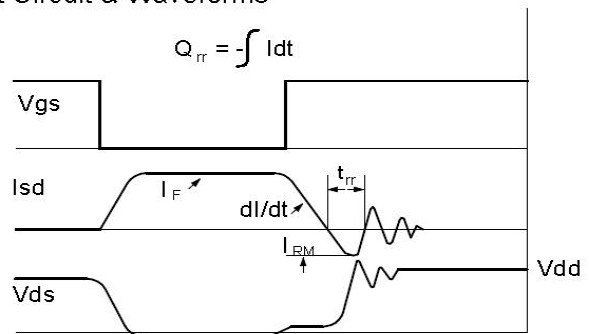
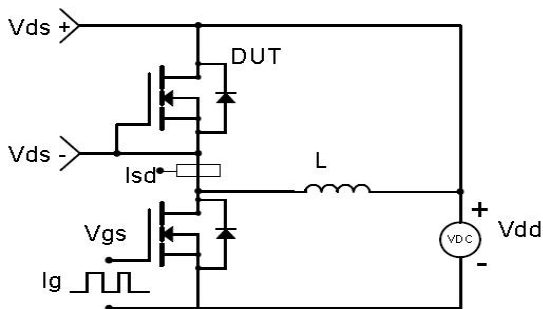
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

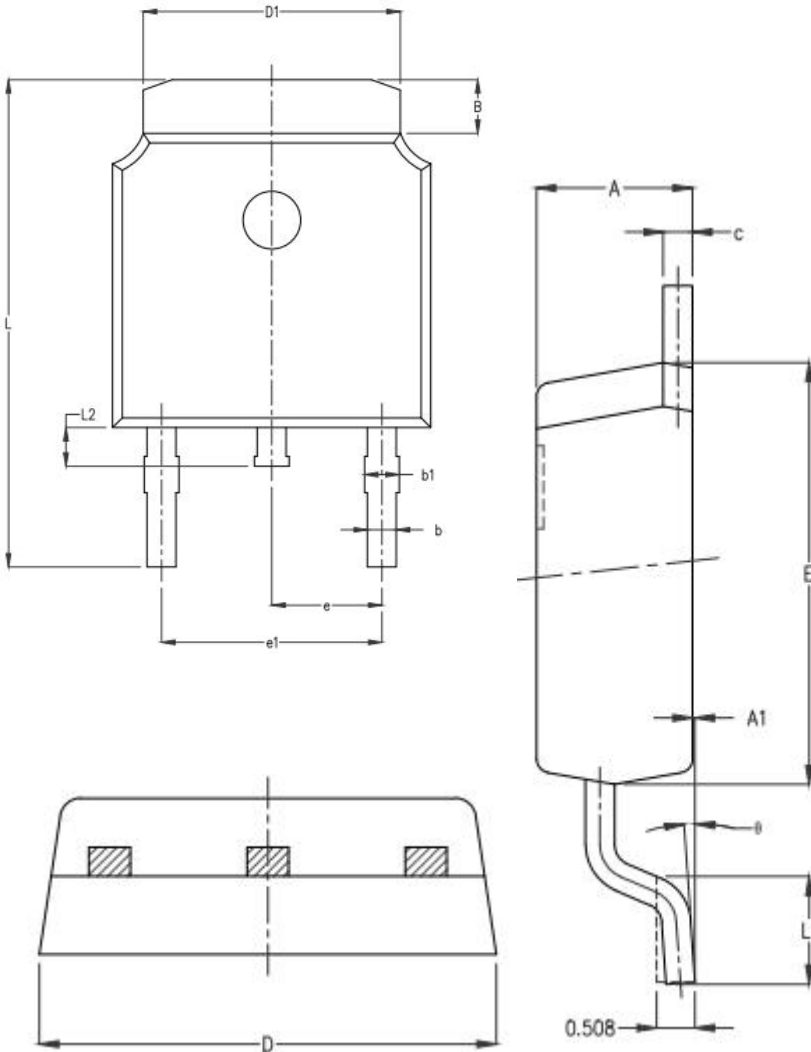


Diode Recovery Test Circuit & Waveforms





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
θ	0°	4°	8°