

**Features**

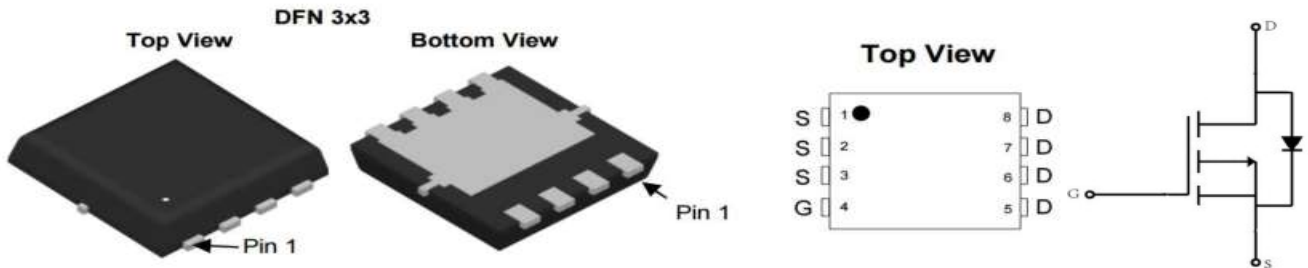
- Uses CRM(CQ) advanced Trench technology
- Extremely low on-resistance  $R_{DS(on)}$
- Excellent  $Q_g \times R_{DS(on)}$  product(FOM)
- Qualified according to JEDEC criteria

**Applications**

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

**Product Summary**

$V_{DS}$	-30V
$R_{DS(on)}$ typ.	10mΩ
$I_D$	-35A

**100% Avalanche Tested**

**Package Marking and Ordering Information**

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRTK140P03LZ	140P03	DFN3.3*3.3	Reel	N/A	N/A	4000 or 5000

**Absolute Maximum Ratings**

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	-30	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)	$I_D$	-64 -35 -41	A
Pulsed drain current ( $T_C = 25^\circ\text{C}$ , $t_p$ limited by $T_{jmax}$ )	$I_{D\ pulse}$	-60	A
Avalanche energy, single pulse ( $L=0.3\text{mH}$ , $R_g=25\Omega$ )	$E_{AS}$	45.5	mJ
Gate-Source voltage	$V_{GS}$	$\pm 20$	V
Power dissipation ( $T_C = 25^\circ\text{C}$ )	$P_{tot}$	78.2	W
Operating junction and storage temperature	$T_j, T_{stg}$	-55...+150	$^\circ\text{C}$
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	$T_{sold}$	260	$^\circ\text{C}$

**Thermal Resistance**

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	$R_{thJc}$	1.6	°C/W
Thermal resistance, junction – ambient(min. footprint)	$R_{thJA}$	81	

**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	$BV_{DSS}$	-30	-	-	V	$V_{GS}=0V, I_D=-250\mu A$
Gate threshold voltage	$V_{GS(th)}$	-1	-1.5	-2.5	V	$V_{DS}=V_{GS}, I_D=-250\mu A$
Zero gate voltage drain current	$I_{DSS}$	-	-0.05	-1	$\mu A$	$V_{DS}=-30V, V_{GS}=0V$ $T_j=25^\circ C$ $T_j=150^\circ C$
Gate-source leakage current	$I_{GSS}$	-	-10	-100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	10	14	$m\Omega$	$V_{GS}=-10V, I_D=-14A,$ $T_j=25^\circ C$ $T_j=150^\circ C$
		-	14	19		
		-	15	26		
Transconductance	$g_{fs}$	-	44	-	S	$V_{DS}=5V, I_D=-14A$

**Dynamic Characteristic**

Input Capacitance	$C_{iss}$	1367	2050	4100	pF	$V_{GS}=0V, V_{DS}=-15V,$ $f=1MHz$
Output Capacitance	$C_{oss}$	227	340	680		
Reverse Transfer Capacitance	$C_{rss}$	177	225	450		
Gate Total Charge	$Q_G$	25	37	75	nC	$V_{GS}=-10V, V_{DS}=-15V,$ $I_D=-22A, f=1MHz$
Gate-Source charge	$Q_{gs}$	6	9	16		
Gate-Drain charge	$Q_{gd}$	5	7	15		
Turn-on delay time	$t_{d(on)}$	7	10	20	ns	$V_{GS}=-10V, V_{DD}=-15V,$ $R_{G\_ext}=2.7\Omega, I_D=-22A$
Rise time	$t_r$	47	71	142		
Turn-off delay time	$t_{d(off)}$	23	34	68		
Fall time	$t_f$	52	78	156		
Gate resistance	$R_G$	3	9	20	$\Omega$	$V_{GS}=0V, V_{DS}=0V,$ $f=1MHz$

**Body Diode Characteristic**

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	$V_{SD}$	-0.4	-0.84	-1.3	V	$V_{GS}=0V, I_{SD}=-14A$
Body Diode Continuous Forward Current	$I_S$			-35	A	$T_C = 25^{\circ}C$
Body Diode Reverse Recovery Time	$t_{rr}$	7.3	14.5	29	ns	$I_F=-22A, dI/dt=100A/\mu s$
Body Diode Reverse Recovery Charge	$Q_{rr}$	2.1	3.2	6.4	nC	

\*The value of  $R_{thJA}$  is measured by placing the device in a still air box which is one cubic foot.

## Typical Performance Characteristics

Fig 1: Output Characteristics

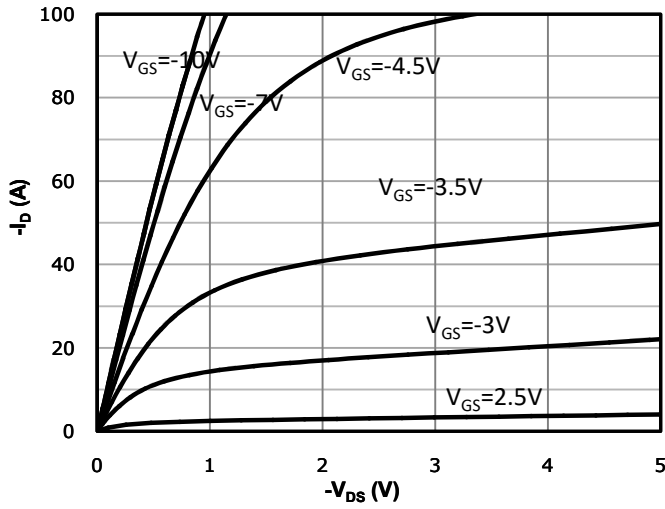


Fig 2: Transfer Characteristics

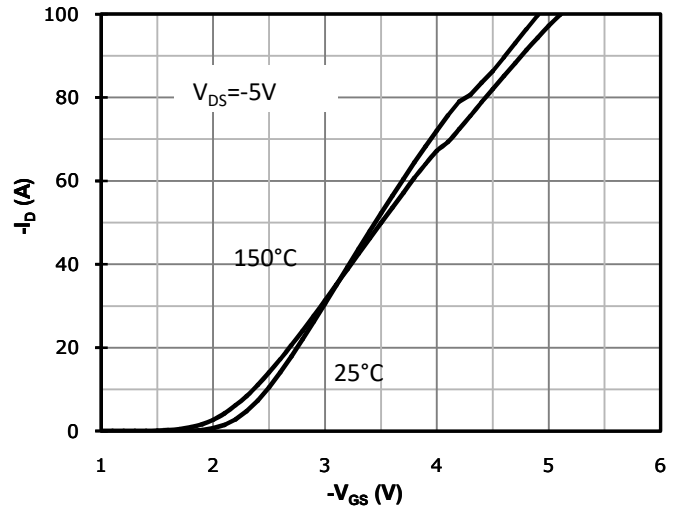


Fig 3:  $R_{DS(on)}$  vs Drain Current and Gate Voltage

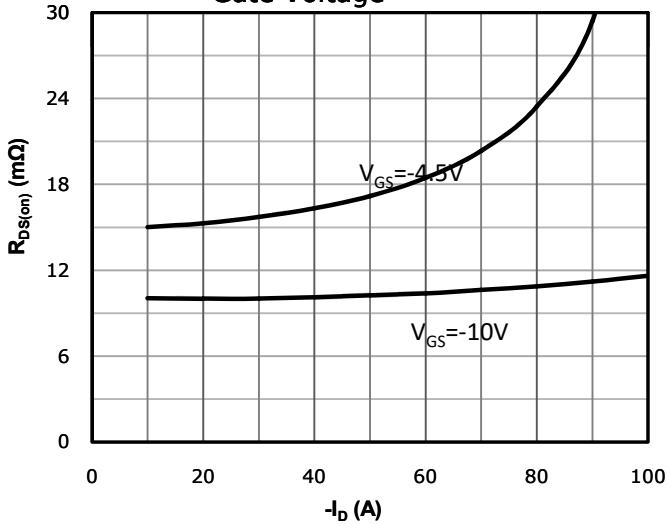


Fig 4:  $R_{DS(on)}$  vs Gate Voltage

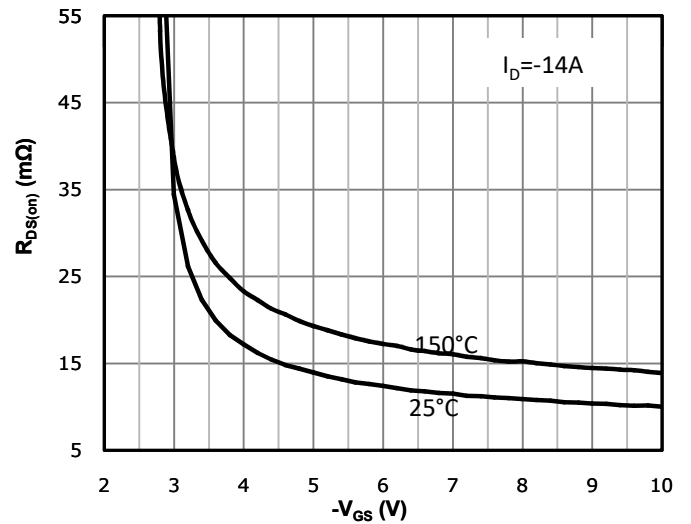


Fig 5:  $R_{DS(on)}$  vs. Temperature

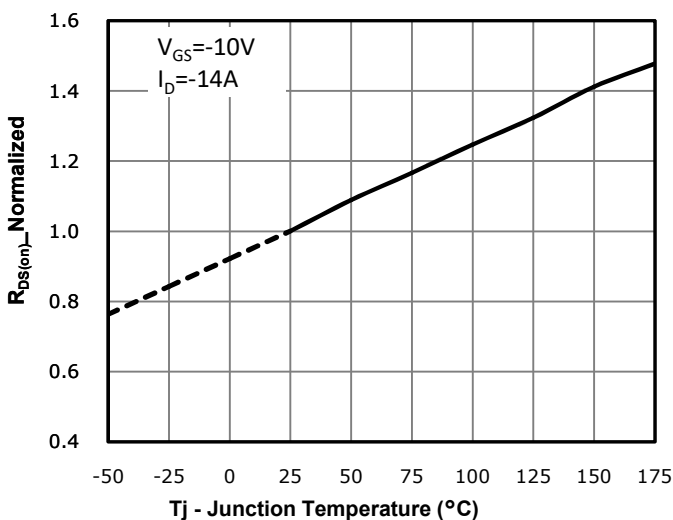


Fig 6: Capacitance Characteristics

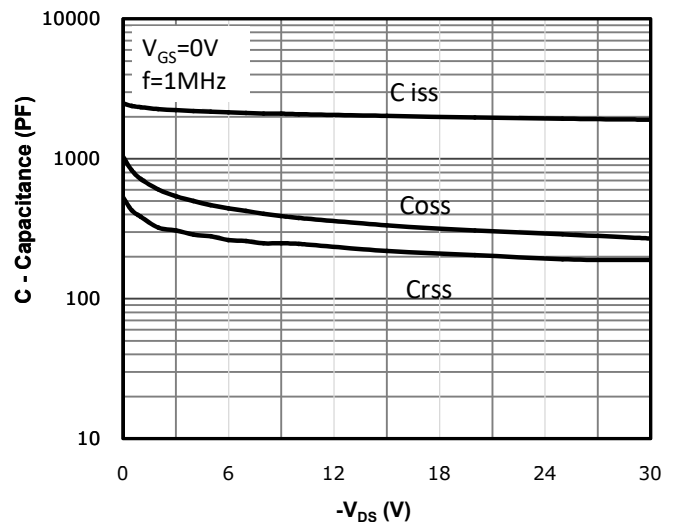


Fig 7: Gate Charge Characteristics

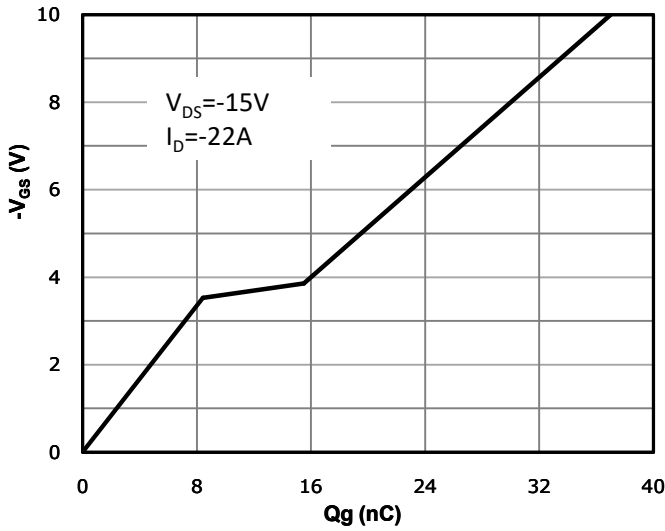


Fig 8: Body-diode Forward Characteristics

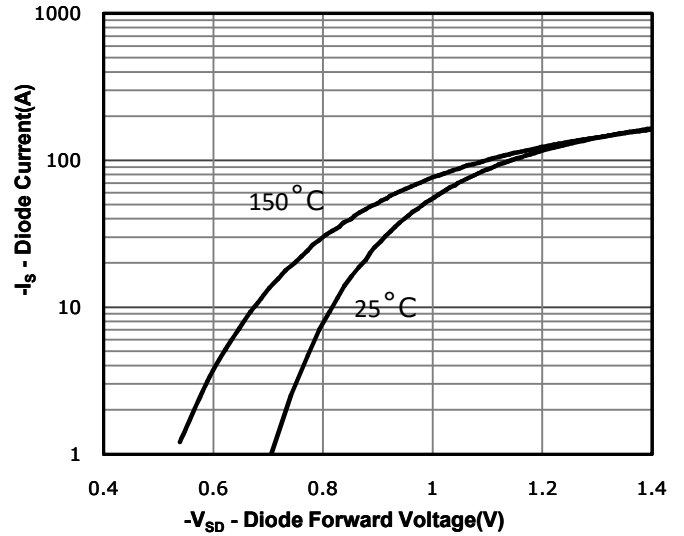


Fig 9: Power Dissipation

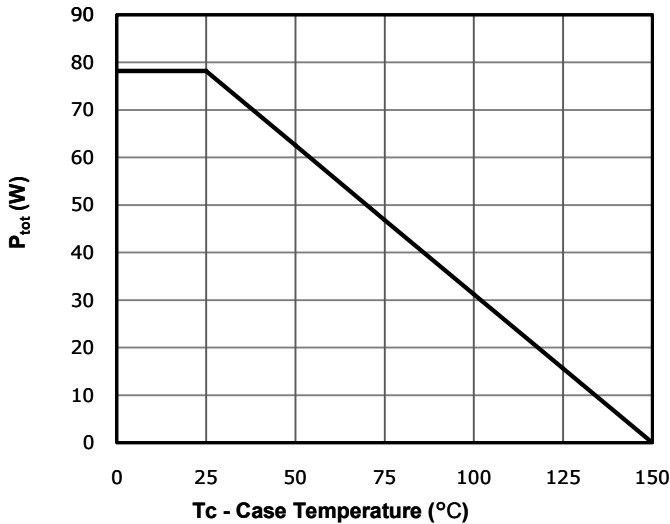


Fig 10: Drain Current Derating

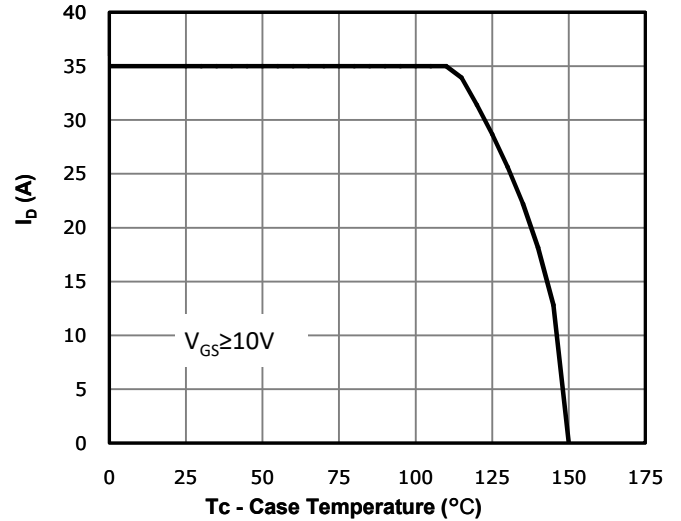


Fig 11: Safe Operating Area

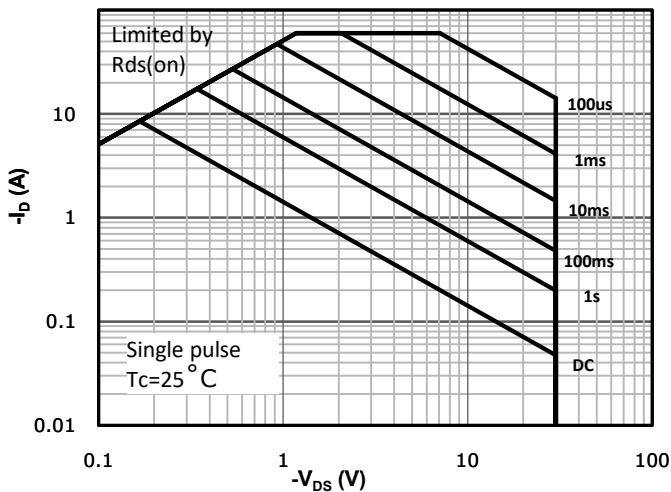
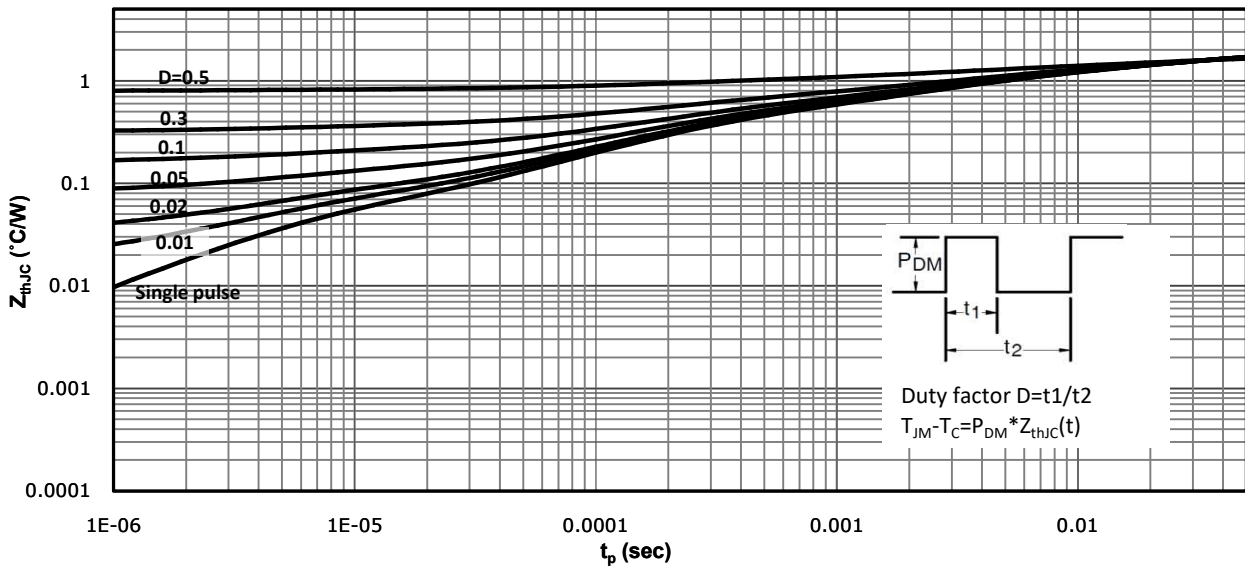
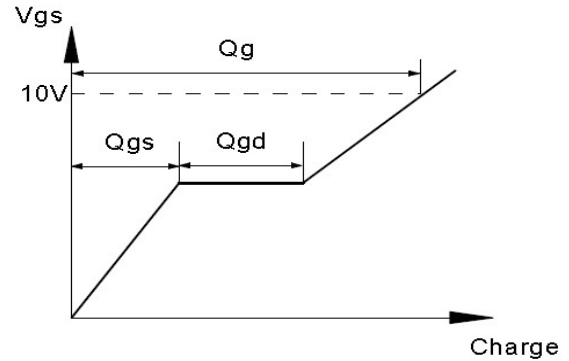
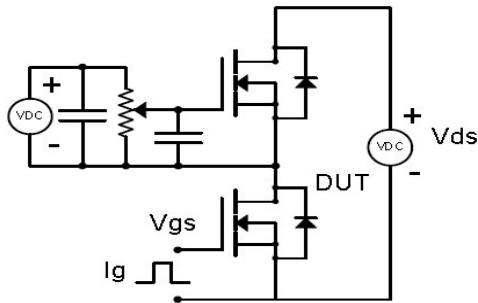


Fig 12: Max. Transient Thermal Impedance

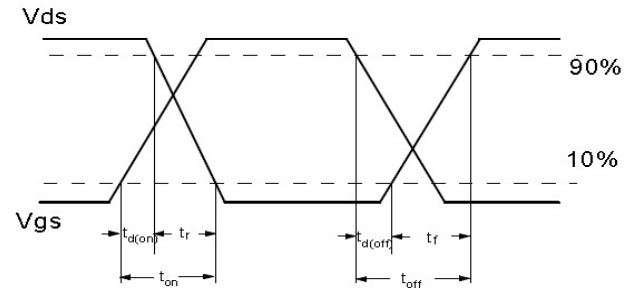
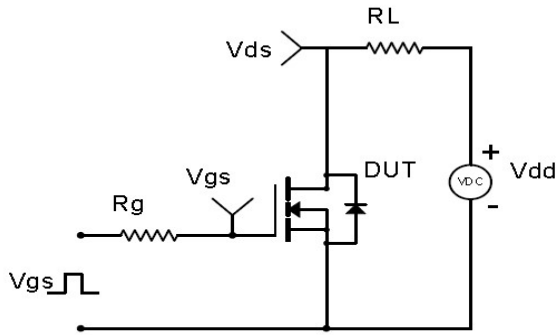


## Test Circuit & Waveform

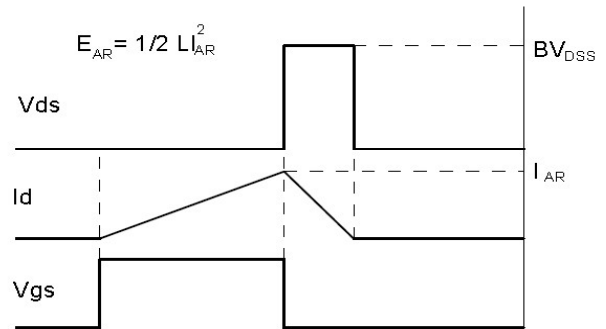
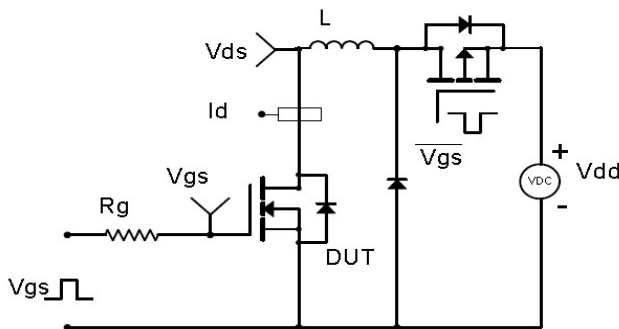
Gate Charge Test Circuit & Waveform



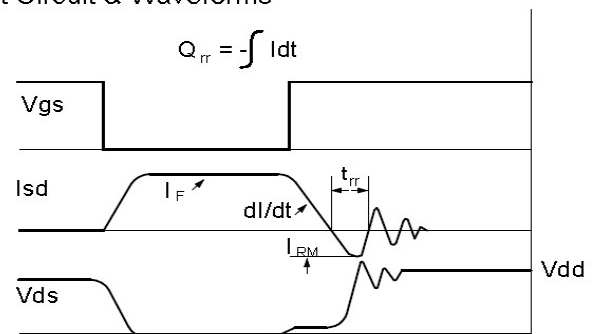
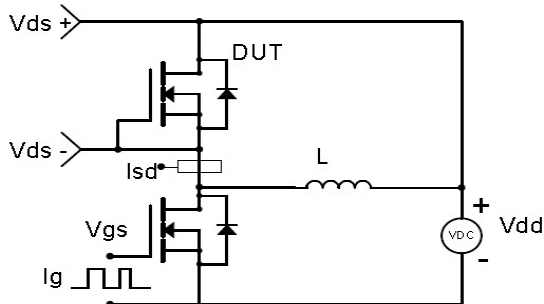
Resistive Switching Test Circuit & Waveforms

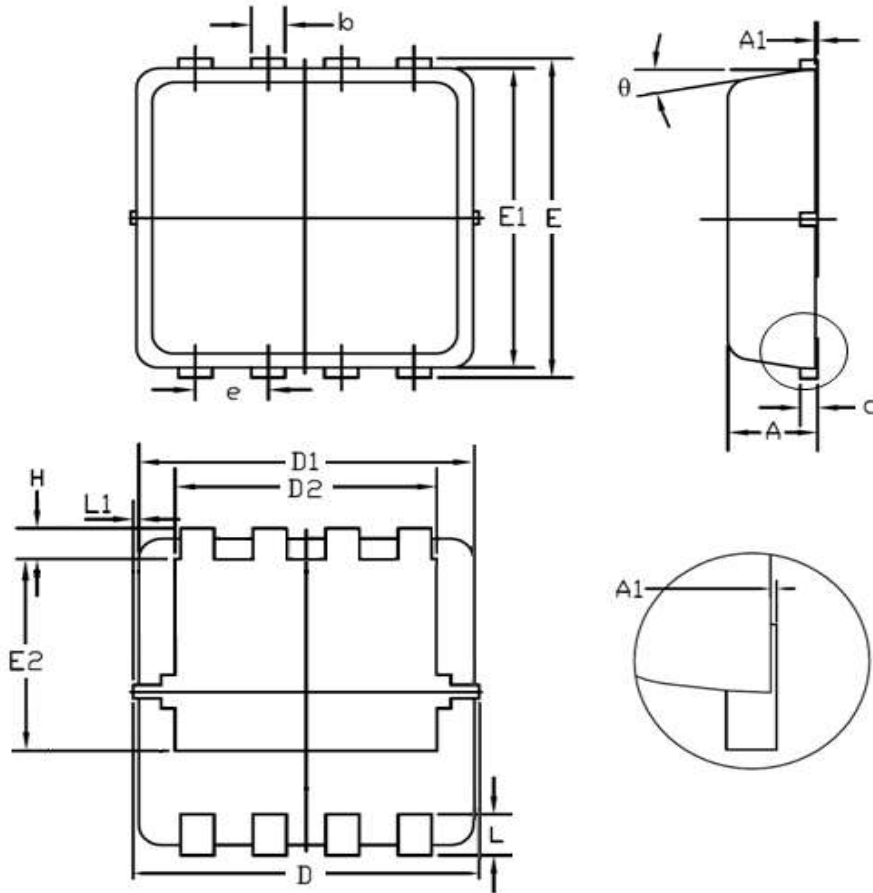


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



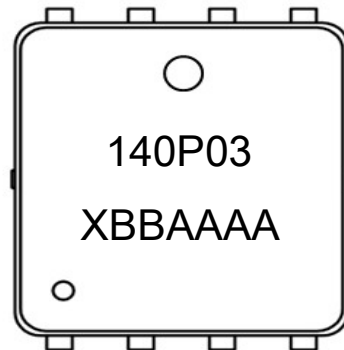
Diode Recovery Test Circuit & Waveforms



**Package Outline: DFN3\*3**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.70	0.90	0.028	0.035
A1	0.00	0.05	0.000	0.002
b	0.20	0.43	0.008	0.017
c	0.10	0.25	0.004	0.010
D	3.00	3.45	0.118	0.136
D1	2.90	3.30	0.114	0.130
D2	1.98	2.65	0.078	0.104
E	3.10	3.45	0.122	0.136
E1	2.80	3.20	0.110	0.126
E2	1.32	1.98	0.052	0.078
e	0.65 BSC		0.026 BSC	
H	0.28	0.65	0.011	0.026
L	0.30	0.65	0.012	0.026
L1	0.13		0.005	
θ	0°	14°	0°	14°





NOTE:  
XBBAAA

X	—Assembly location code
BB	—Fab code
AAAA	—Lot code

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**Revision History**

Revision	Date	Major changes
1.0	2022/8/31	Release of formal version.

**Disclaimer**

Unless otherwise specified in the datasheet, the product is designed and qualified as a standard commercial Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal CRM(CO) reserves the right to improve product design, function and reliability without notice.

单击下面可查看定价，库存，交付和生命周期等信息

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