

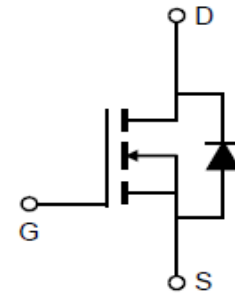


Features

- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

Applications

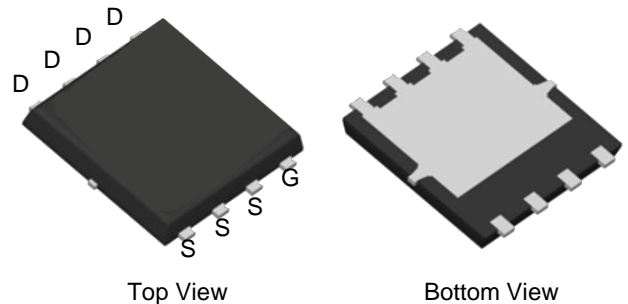
- Synchronous Rectification for AC/DC Quick Charger
- Battery management
- UPS (Uninterruptible Power Supplies)



Product Summary

V_{DS}	200V
$R_{DS(on)}@10V$ typ	36m Ω
I_D	35A

DFN5x6_8L



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	200	V
Continuous drain current $T_C = 25^\circ\text{C}$ (Silicon limit) $T_C = 100^\circ\text{C}$ (Silicon limit)	I_D	36 19	A
Pulsed drain current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	$I_{D\ pulse}$	76	A
Avalanche energy, single pulse ($I_{as}=13A$, $R_g=25\Omega$)	E_{AS}	42.2	mJ
Gate-Source voltage	V_{GS}	± 20	V
Power dissipation ($T_C = 25^\circ\text{C}$)	P_{tot}	54	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	Test Condition	Value			Unit
			min.	typ.	max.	
Thermal resistance, junction – case.	RthJC	-	-	1.55	2.30	°C/W
Thermal resistance, junction - ambient(min. footprint)	RthJA	-	-	-	55	°C/W

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

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

Static Characteristic

Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	200	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	3.5	4.5	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=160V, V_{GS}=0V$ $T_j=25^\circ C$	-	0.1	1	μA
		$T_j=125^\circ C$	-	10	100	
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$	-	36	40	m Ω
		$V_{GS}=10V, I_D=9.5A$	-	40	37	
Transconductance	g_{fs}	$V_{DS}=5V, I_D=9.5A$	-	14	-	S

Dynamic Characteristic

Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=100V,$ $f=1MHz$	-	834.0	1251	μF
Output Capacitance	C_{oss}		-	80.0	120	
Reverse Transfer Capacitance	C_{rss}		-	22.7	45.4	
Gate Total Charge	Q_G	$V_{GS}=10V, V_{DS}=100V,$ $I_D=9.5A, f=1MHz$	-	13	19.5	nC
Gate-Source charge	Q_{gs}		-	5.6	-	
Gate-Drain charge	Q_{gd}		-	2.5	5.0	
Turn-on delay time	$t_{d(on)}$	$V_{GS}=10V,$ $V_{DD}=100V,$ $I_D=9.5A, R_{G_{ext}}=2.7\Omega$	-	9.5	-	ns
Rise time	t_r		-	10.8	-	
Turn-off delay time	$t_{d(off)}$		-	15.1	-	
Fall time	t_f		-	11.1	-	
Gate resistance	R_G	$V_{GS}=0V, V_{DS}=0V,$ $f=1MHz$	-	1.8	2.7	Ω



Body Diode Characteristic

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Body Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=9.5A$	-	0.82	1.2	V
Body Diode Continuous Forward Current	I_S	TC = 25°C	-	-	19	A
Body Diode Pulsed Current	I_S pulse	TC = 25°C	-	-	76	A
Body Diode Reverse Recovery Time	t_{rr}	$I_F=9.5A,$ $dI/dt=100A/\mu s$	-	81.1	162.2	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	297.5	595	nC



Typical Performance Characteristics

Fig 1: Output Characteristics

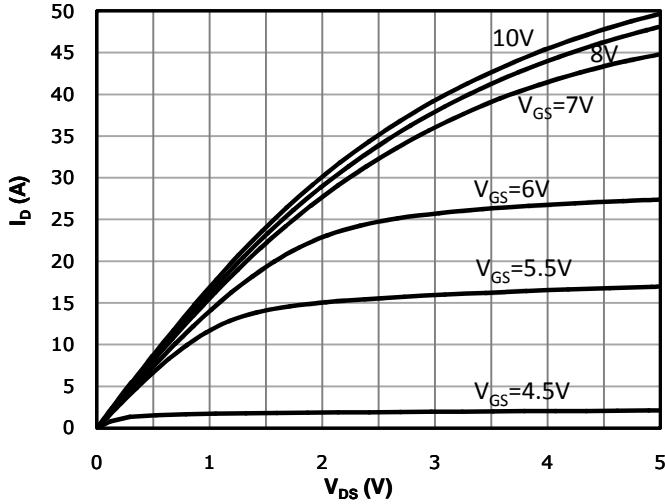


Fig 2: Transfer Characteristics

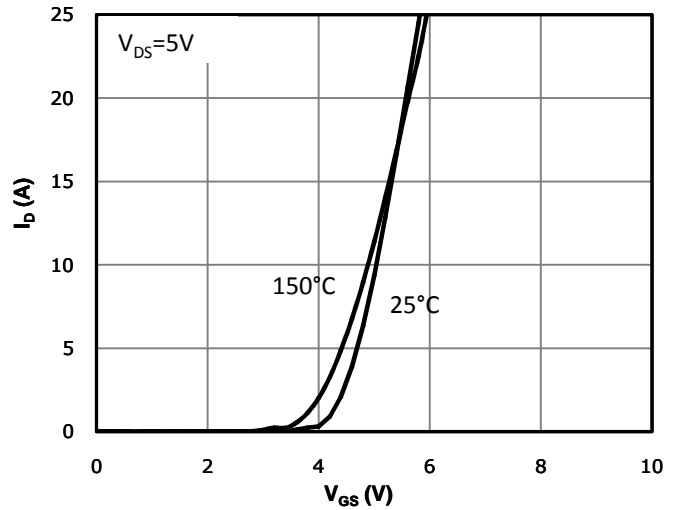


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

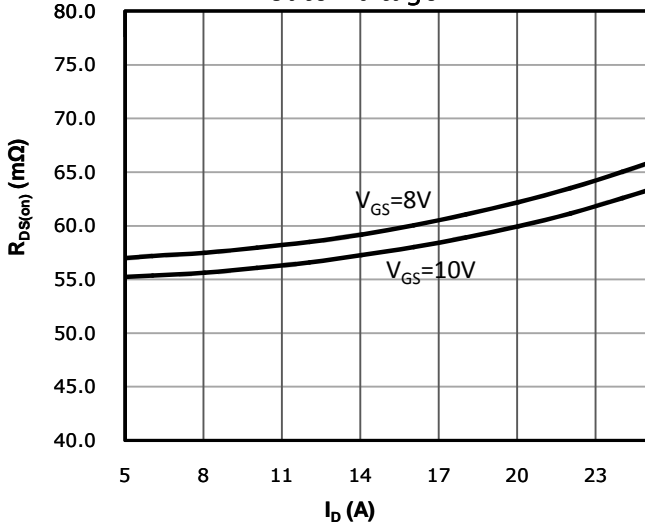


Fig 4: $R_{DS(on)}$ vs Gate Voltage

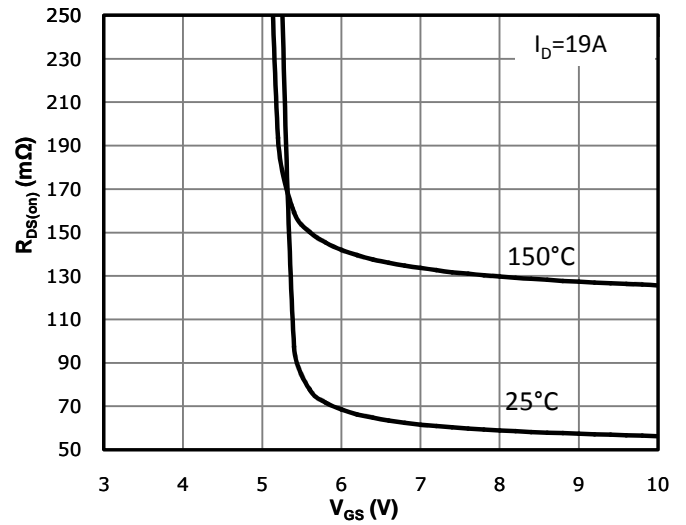


Fig 5: $R_{DS(on)}$ vs. Temperature

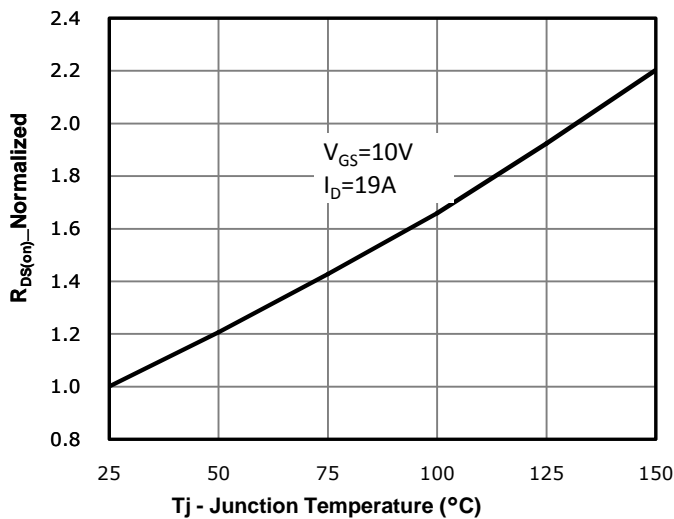


Fig 6: Capacitance Characteristics

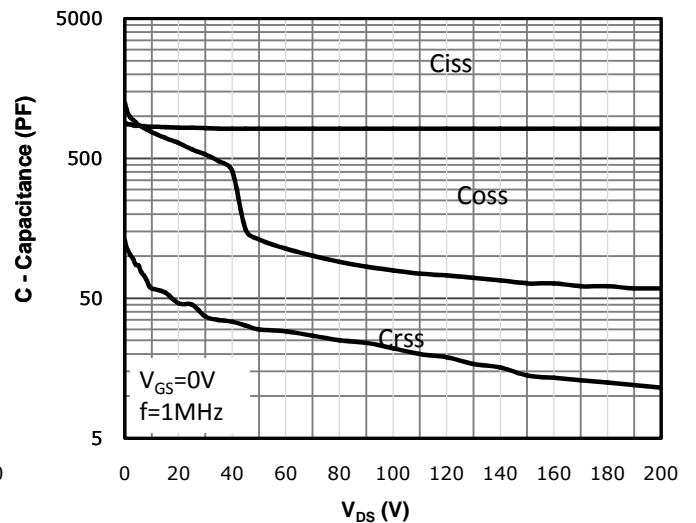




Fig 7: Gate Charge Characteristics

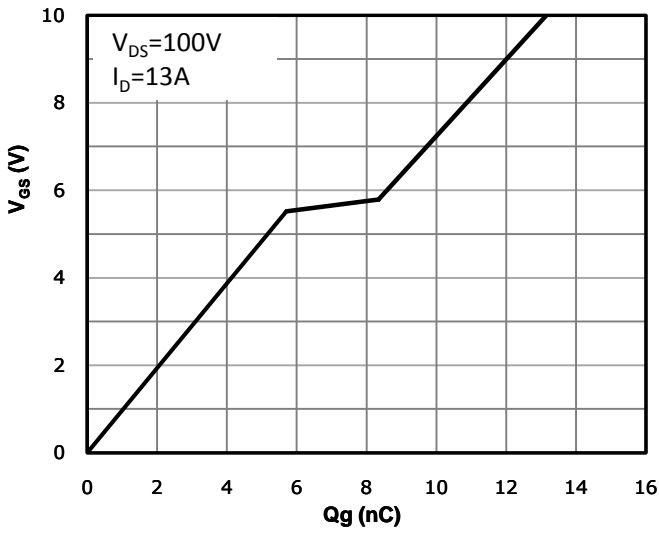


Fig 8: Body-diode Forward Characteristics

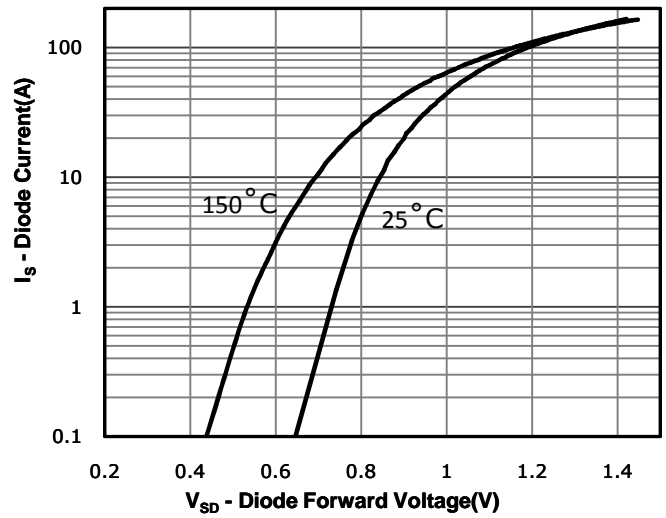


Fig 9: Power Dissipation

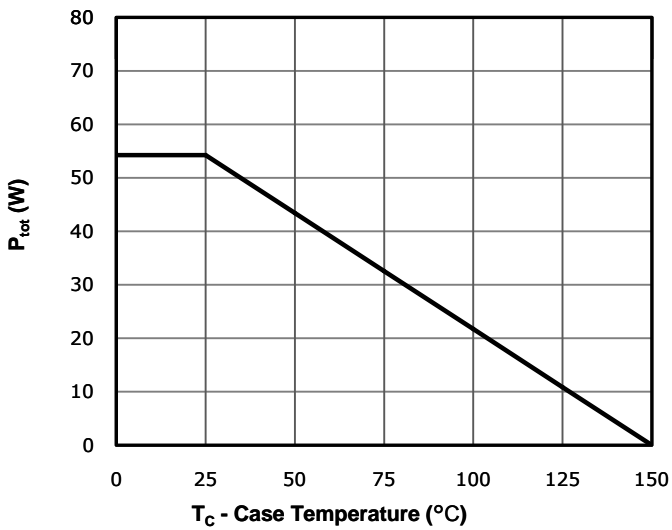


Fig 10: Drain Current Derating

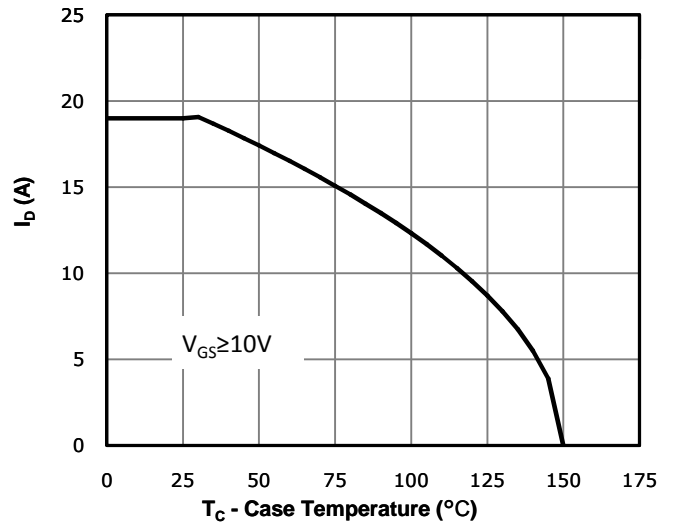


Fig 11: Safe Operating Area

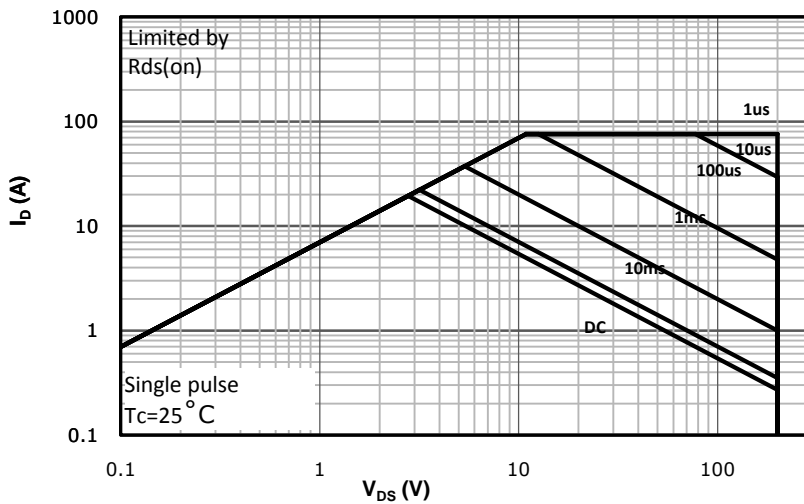
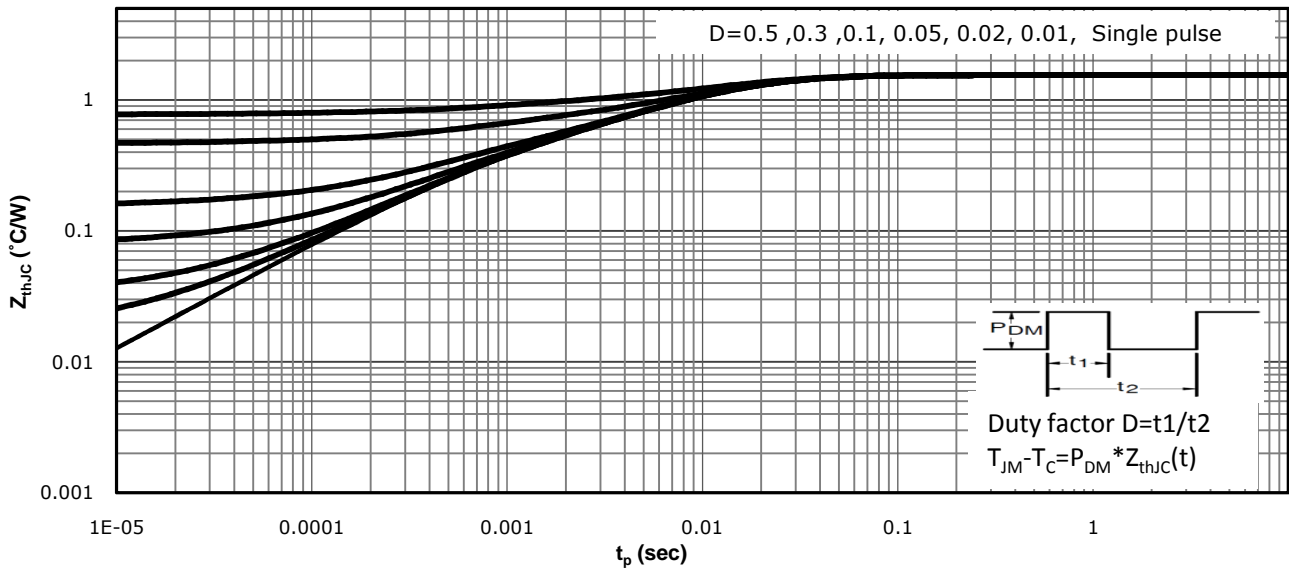




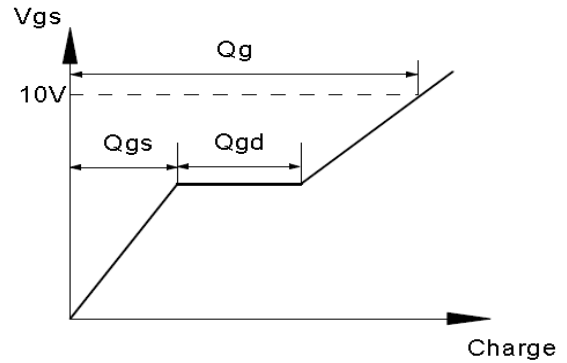
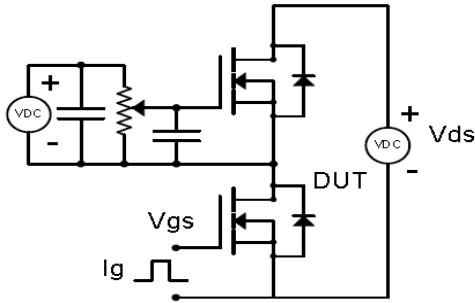
Fig 12: Max. Transient Thermal Impedance



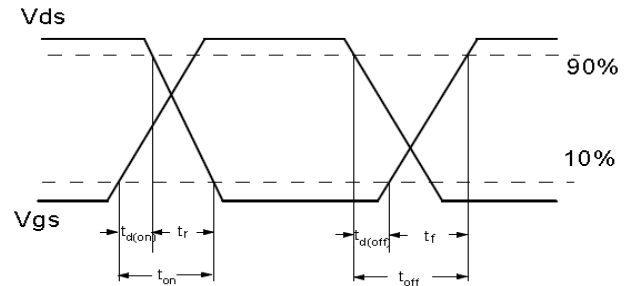
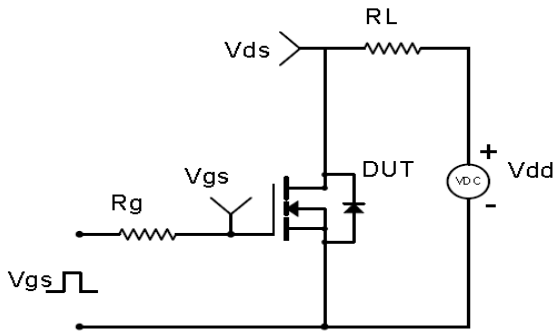


Test Circuit & Waveform

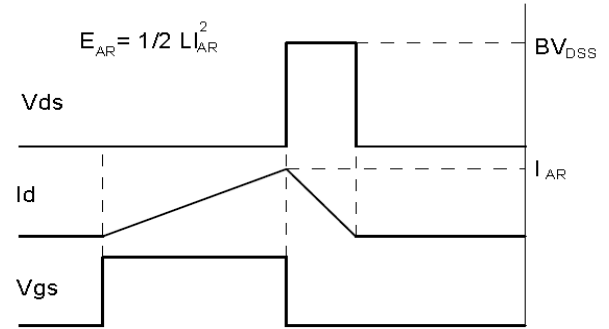
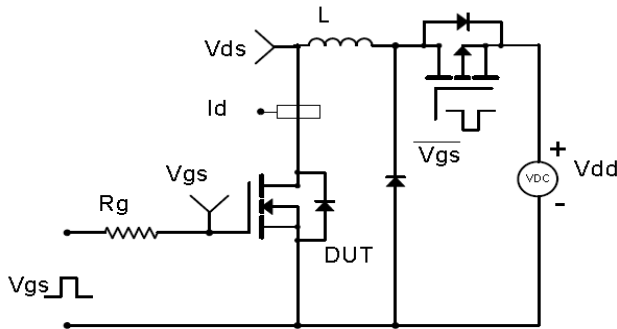
Gate Charge Test Circuit & Waveform



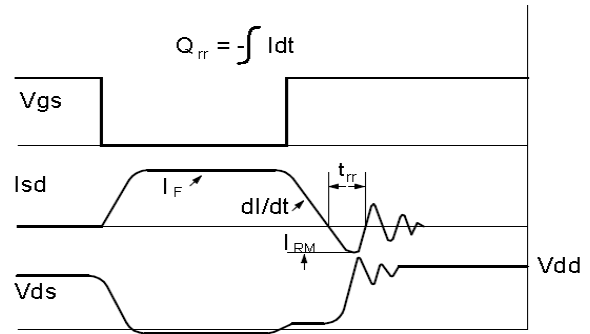
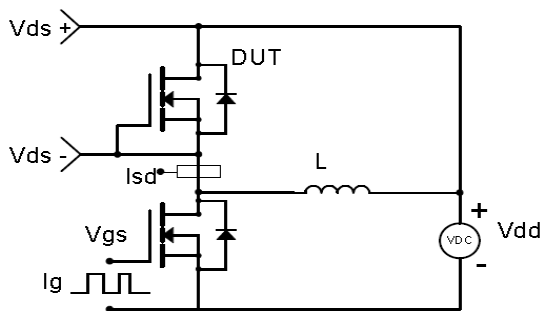
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

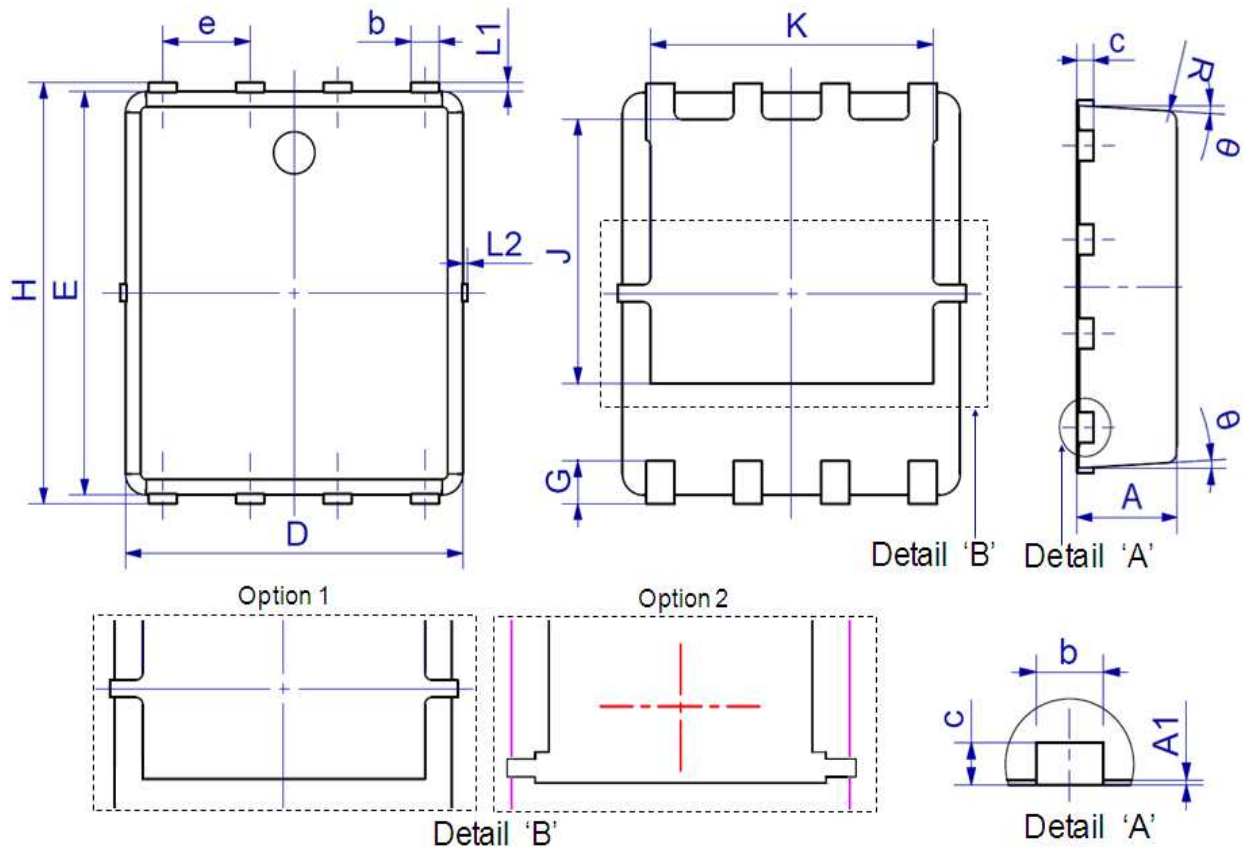


Diode Recovery Test Circuit & Waveforms





Package Outline: DFN5X6 Cu Clip



Symbol				
	Min.	Max.	Min.	Max.
A	0.80	1.20	0.031	0.047
A1	0.00	0.05	0.000	0.002
b	0.30	0.51	0.012	0.020
c	0.15	0.35	0.006	0.014
D	4.80	5.40	0.189	0.213
e	1.27 BSC		0.050 BSC	
E	5.66	6.06	0.223	0.239
G	0.30	0.71	0.012	0.028
H	5.90	6.35	0.232	0.250
J	3.32	3.92	0.131	0.154
K	3.61	4.25	0.142	0.167
L1	0.05	0.25	0.002	0.010
L2	0.00	0.15	0.000	0.006
R	0.25 REF		0.010 REF	
θ	0°	12°	0°	12°



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