

Features

- Low on resistance
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- 100% ΔV_{DS} test
- Pb-Free plating / Halogen-Free / RoHS compliant

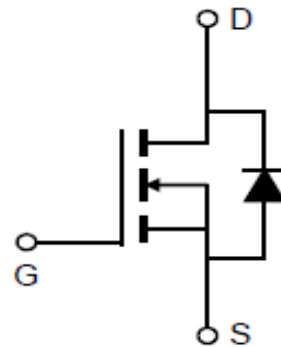
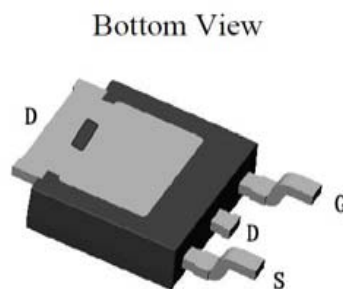
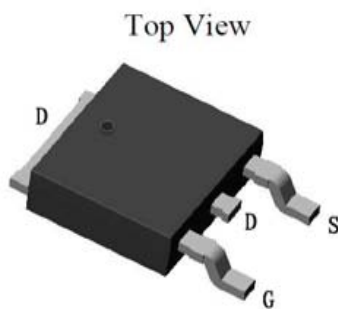
Applications

- Motor Control and Drive
- Charge/Discharge for Battery Management System
- Synchronous Rectifier for SMPS

Key Parameters

V_{DS}	68V
$R_{DS(on)typ.}$	7.2mΩ
I_D	80A
V_{th}	3V
$C_{iss@10V}$	2859pF
Q_{gd}	19nC

TO-252



Marking & Packing Information

Part #	Package	Marking	Tube/Reel	Qty(pcs)
SFD082N68C3	TO-252	082N68C3	Tape & Reel	2500/box

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	68	V
Gate-Source voltage	V_{GS}	±20	V
Continuous drain current $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	I_D	80 51	A
Pulsed drain current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	$I_{D \text{ pulse}}$	320	A
Avalanche energy, single pulse ($L=0.5\text{mH}$, $R_g=25\Omega$) ⁽¹⁾	E_{AS}	289	mJ
Power dissipation $T_C = 25^\circ\text{C}$ $T_A = 25^\circ\text{C}$	P_{tot}	89	W
		1.7	W
Operating junction and storage temperature	T_j, T_{stg}	-55...+150	°C

Notes: 1. E_{AS} was tested at $T_j = 25^\circ\text{C}$, $L = 0.5\text{mH}$, $I_D=24\text{A}$.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	1.4	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	75	

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

Static Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Drain-source breakdown voltage	BV_{DSS}	68	-	-	V	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	2.0	3.0	4.0	V	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=68\text{V}$, $V_{GS}=0\text{V}$ $T_j=25^\circ\text{C}$
		-	-	100		$T_j=125^\circ\text{C}$
Gate-source leakage current	I_{GSS}	-	-	100	nA	$V_{GS}=20\text{V}$, $V_{DS}=0\text{V}$
Drain-source on-state resistance	$R_{DS(on)}$	-	7.2	8.0	mΩ	$V_{GS}=10\text{V}$, $I_D=30\text{A}$, $T_j=25^\circ\text{C}$
Transconductance	g_{fs}	-	36	-	S	$V_{DS}=5\text{V}$, $I_D=30\text{A}$

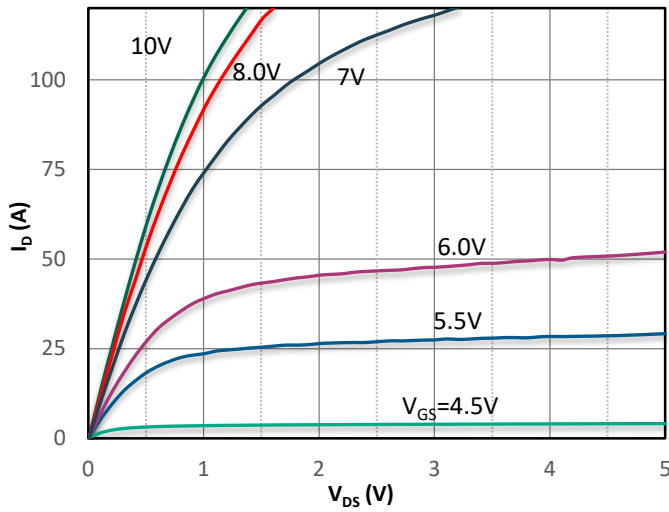
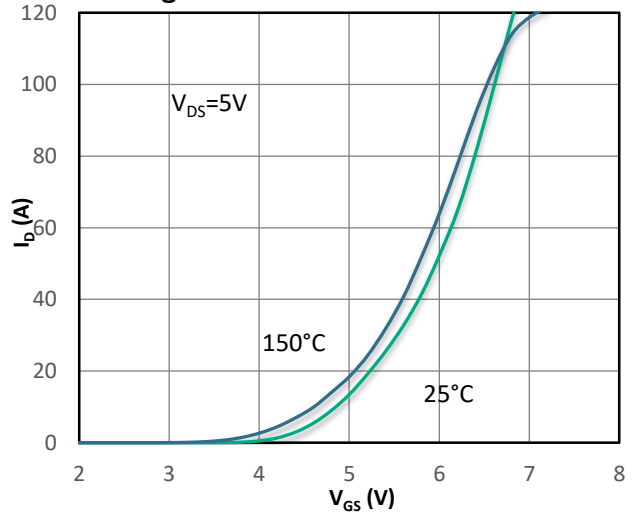
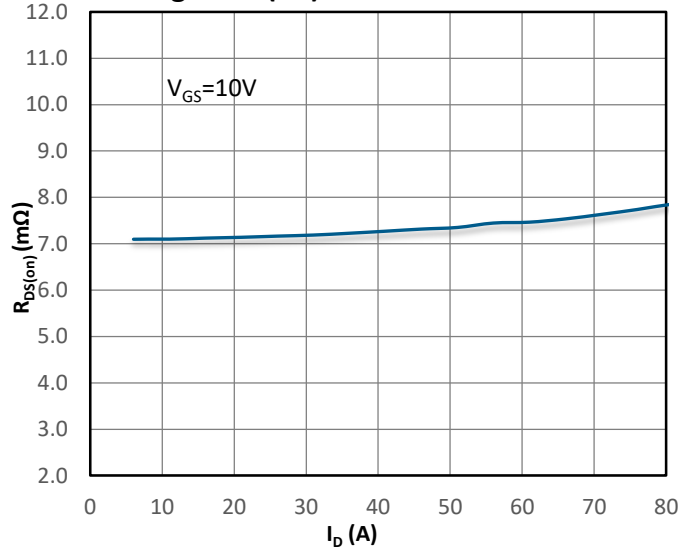
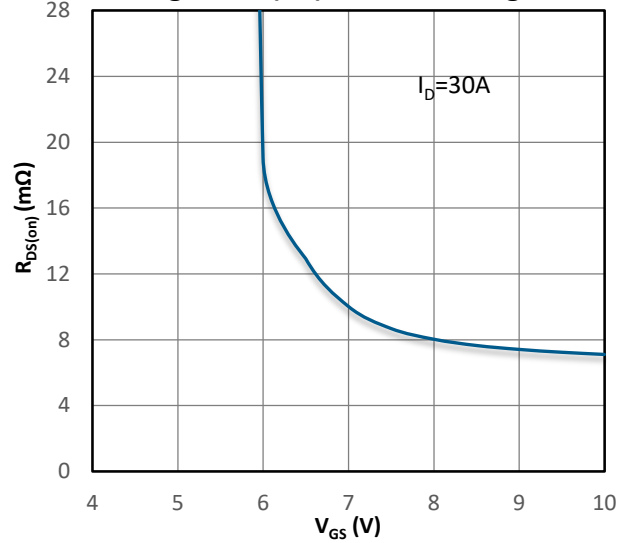
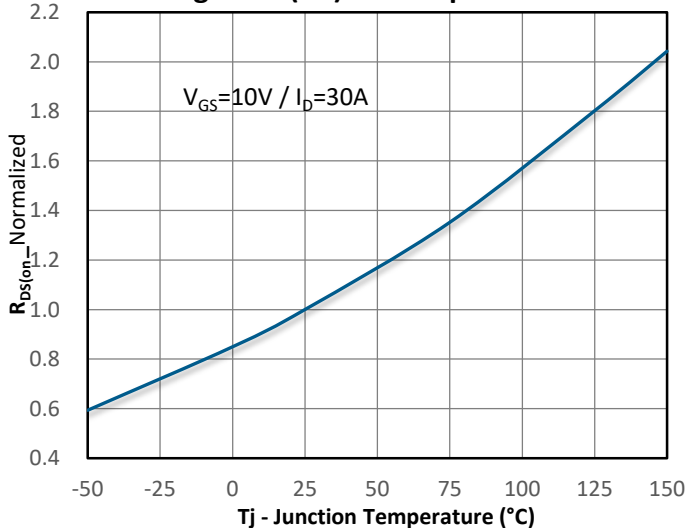
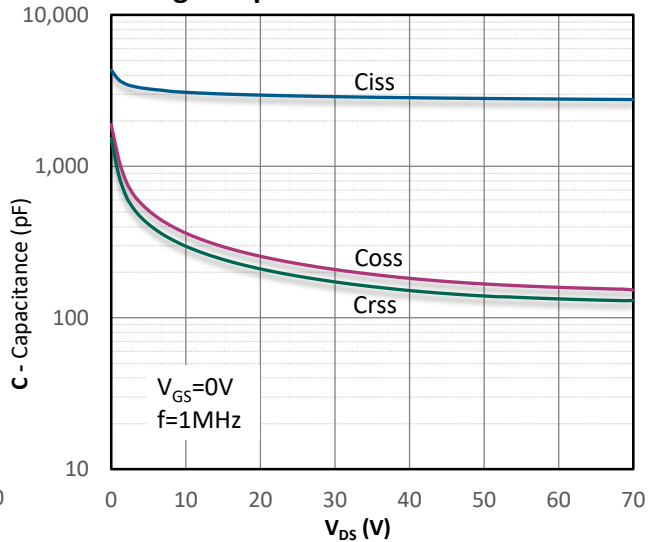
Dynamic Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Input Capacitance	C_{iss}	-	2859	-	pF	$V_{GS}=0V$, $V_{DS}=35V$, $f=1MHz$
Output Capacitance	C_{oss}	-	193	-		
Reverse Transfer Capacitance	C_{rss}	-	160	-		
Gate Total Charge	Q_G	-	59	-	nC	$V_{GS}=10V$, $V_{DS}=35V$, $I_D=30A$
Gate-Source charge	Q_{gs}	-	17	-		
Gate-Drain charge	Q_{gd}	-	19	-		
Gate plateau voltage	$V_{plateau}$	-	5.8	-	V	
Turn-on delay time	$t_{d(on)}$	-	13	-	ns	$V_{GS}=10V$, $V_{DD}=35V$, $R_{G_ext}=3\Omega$
Rise time	t_r	-	28	-		
Turn-off delay time	$t_{d(off)}$	-	34	-		
Fall time	t_f	-	11	-		
Gate resistance	R_G	-	1.4	-	Ω	$V_{GS}=0V$, $V_{DS}=0V$, $f=1MHz$

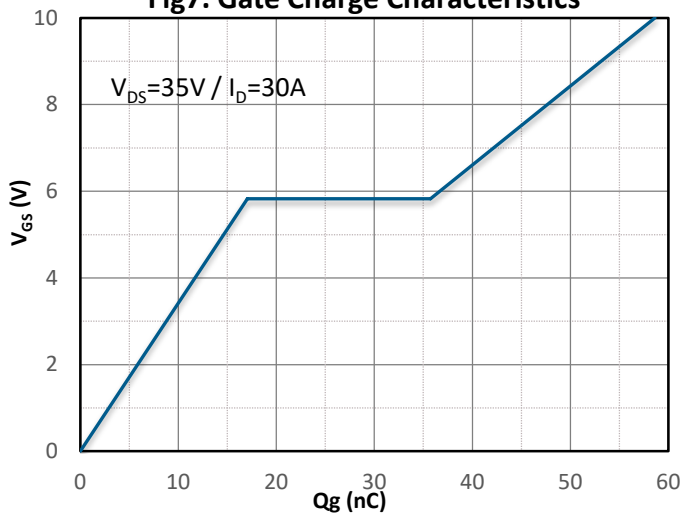
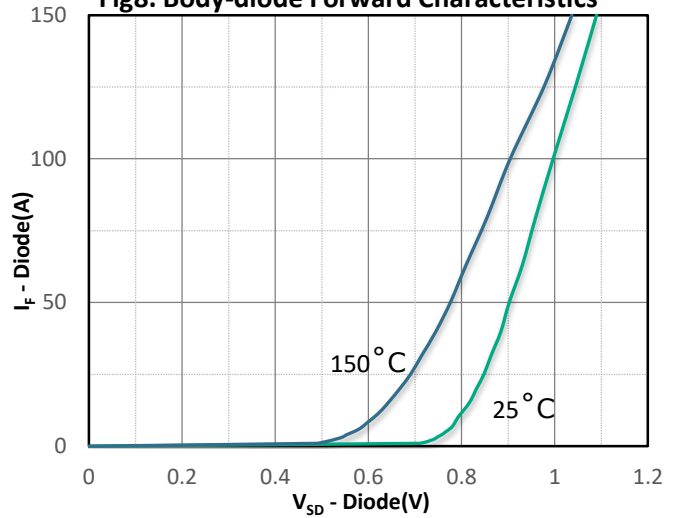
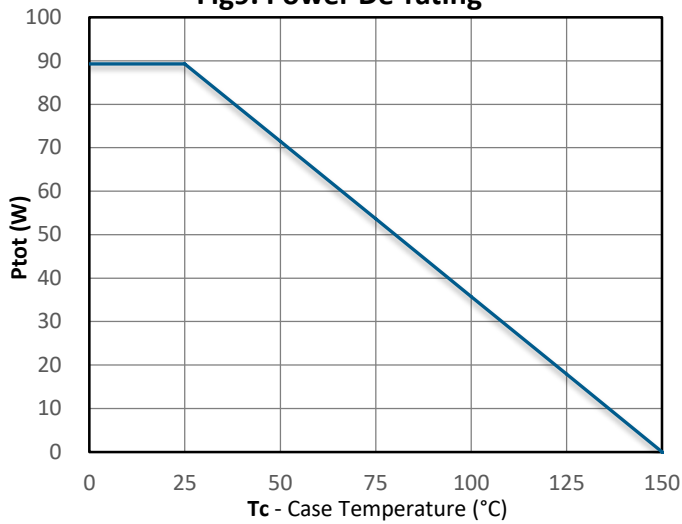
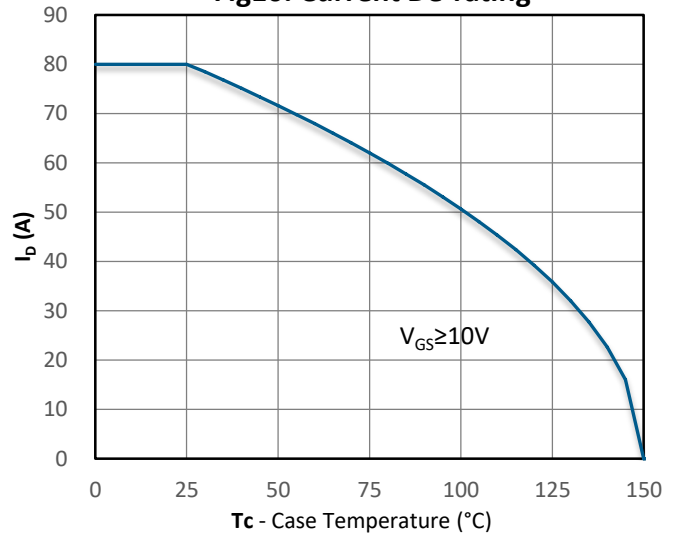
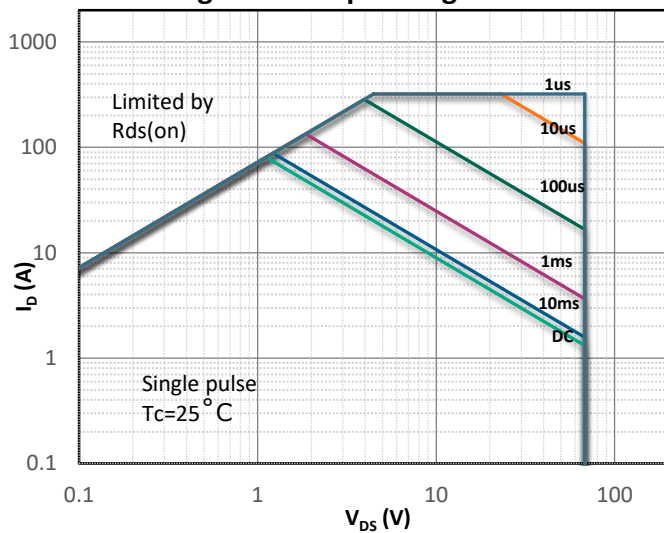
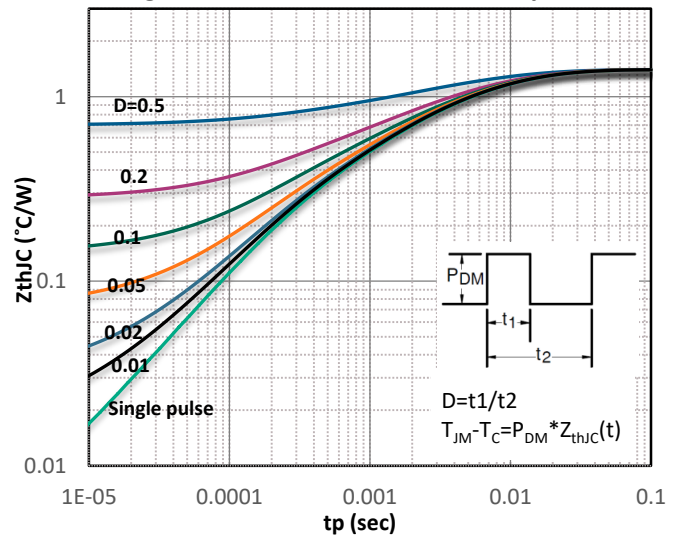
Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Diode Max Current	I_S		-	80	A	-
Diode Forward Voltage	V_{SD}	-	-	1.2	V	$V_{GS}=0V$, $I_{SD}=30A$
Diode Reverse Recovery Time	t_{rr}	-	29	-	ns	$I_F=30A$, $dI/dt=100A/\mu s$
Diode Reverse Recovery Charge	Q_{rr}	-	21	-	nC	

Typical Characteristics Diagram

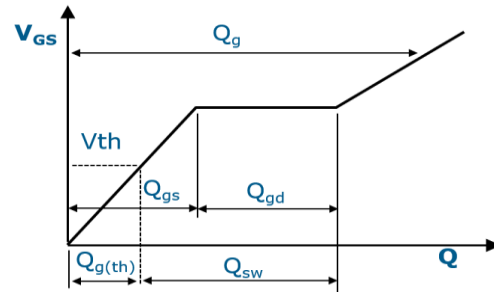
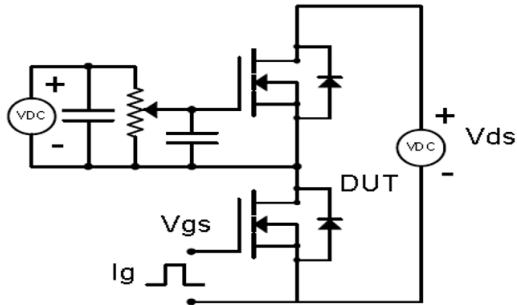
Fig1. Output Characteristics

Fig2. Transfer Characteristics

Fig3. Rds(on) vs Drain Current

Fig 4. Rds(on) vs Gate Voltage

Fig5. Rds(on) vs. Temperature

Fig6. Capacitance Characteristics


Typical Characteristics Diagram

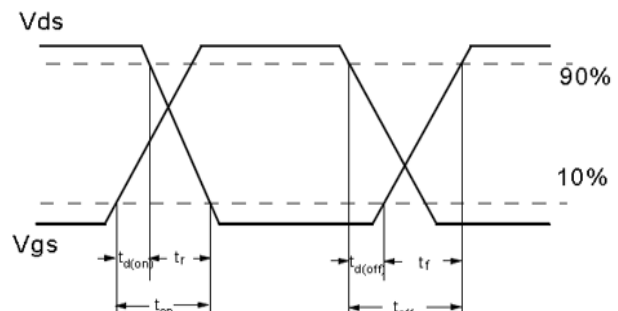
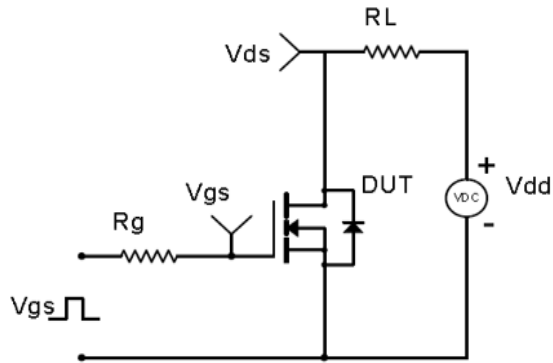
Fig7. Gate Charge Characteristics

Fig8. Body-diode Forward Characteristics

Fig9. Power De-rating

Fig10. Current De-rating

Fig11. Safe Operating Area

Fig12. Max. Transient Thermal Impedance


Test Circuit & Waveform

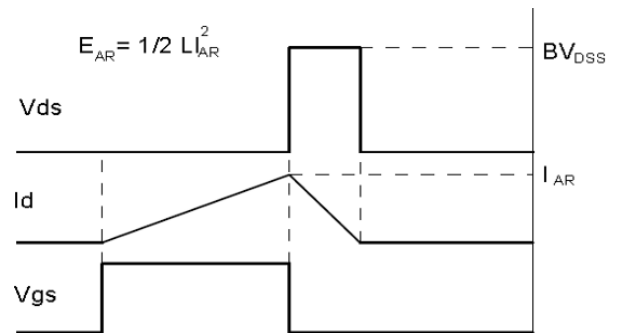
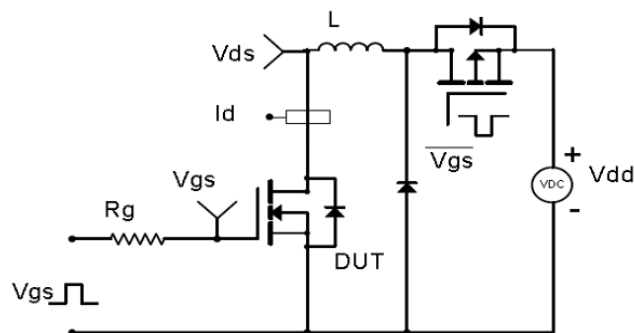
Gate Charge Test Circuit & Waveform



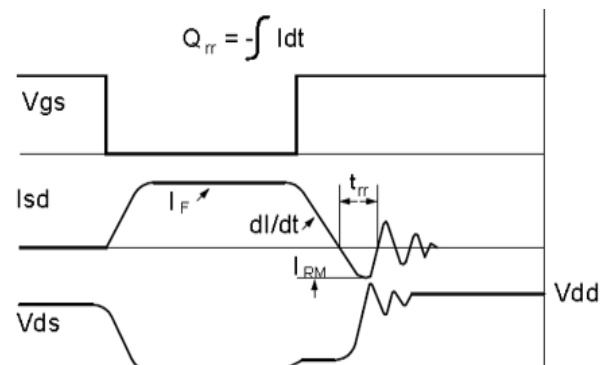
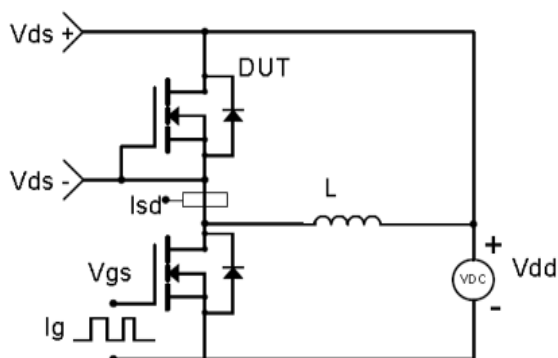
MOSFET Switching Test Circuit & Waveform

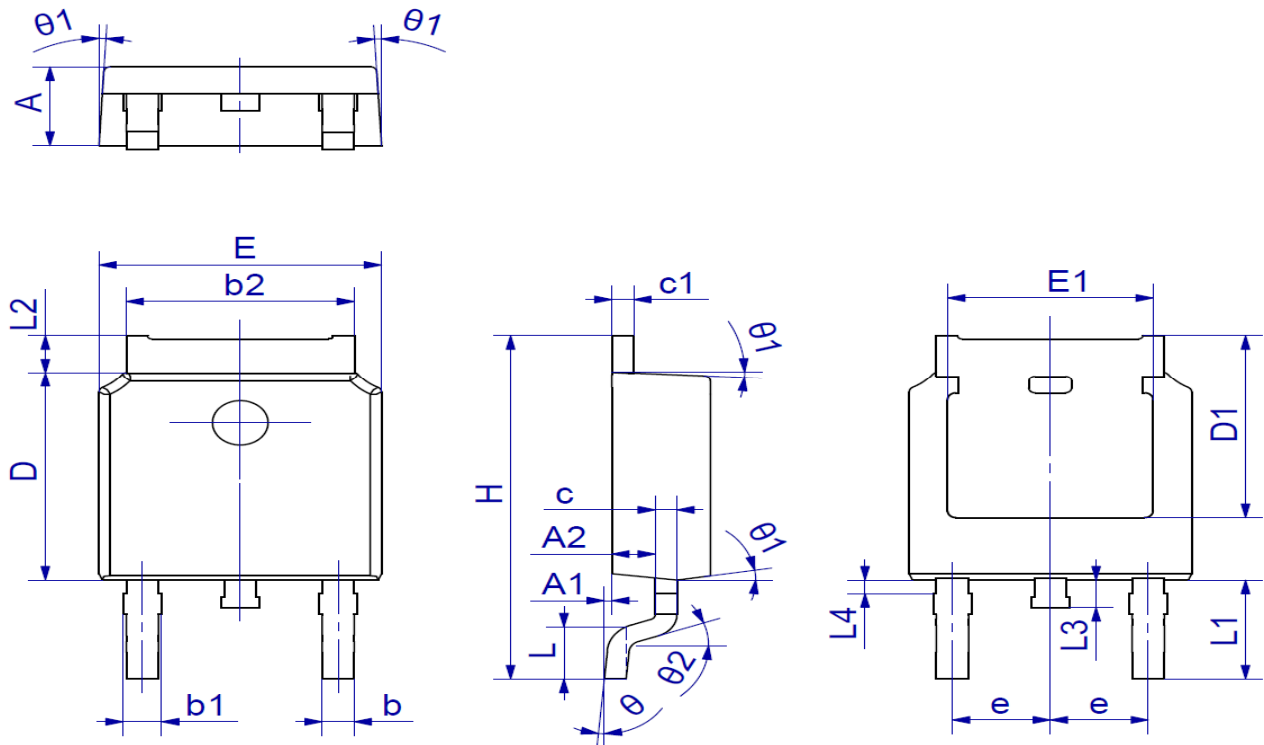


E_{AS} Test Circuit & Waveform



Diode Recovery Test Circuit & Waveform



Package Outline: TO-252


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.10	2.50	0.083	0.098
A1	0	0.15	0.000	0.006
A2	0.76	1.36	0.030	0.054
b	0.61	0.85	0.024	0.033
b1	0.71	0.91	0.028	0.036
b2	5.04	5.64	0.198	0.222
c	0.508 TYP.		0.02 TYP.	
c1	0.508 TYP.		0.02 TYP.	
D	5.8	6.3	0.228	0.248
D1	5	5.6	0.197	0.220
E	6.3	6.9	0.248	0.272
E1	4.55	5.15	0.179	0.203
e	2.286 TYP.		0.09 TYP.	
H	9.65	10.4	0.380	0.409
L	1.4	1.7	0.055	0.067
L1	2.90 REF.		0.114 REF.	
L2	0.75	1.35	0.030	0.053
L3	0.6	1.2	0.024	0.047
θ	0°	10°	0°	10°
θ1	5°	9°	5°	9°
θ2	25° REF.		25° REF.	