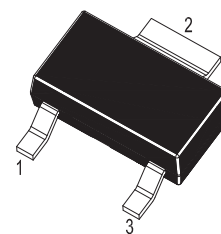
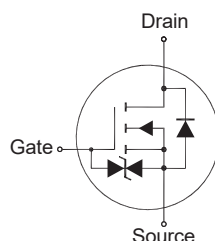


N-Channel Enhancement Mode MOSFET

Features

- Halogen and Antimony Free(HAF), RoHS compliant
- Built-in G-S Protection Diode
- Typical ESD Protection HBM Class 1C

Classification	Voltage Range (V)
0A	< 125
0B	125 to < 250
1A	250 to < 500
1B	500 to < 1000
1C	1000 to < 2000
2	2000 to < 4000
3A	4000 to < 8000
3B	≥8000



1.Gate 2.Drain 3.Source
SOT-223-2 Plastic Package

Key Parameters

Parameter	Value	Unit
BV_{DSS}	750	V
$R_{DS(ON)}$ Max	1.6 @ $V_{GS} = 10$ V	Ω
$V_{GS(th)}$ typ	3.2	V
Q_g typ	7 @ $V_{GS} = 10$ V	nC

Absolute Maximum Ratings (at $T_a = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	750	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	$T_c = 25^\circ\text{C}$ 5.4 $T_c = 100^\circ\text{C}$ 3.4	A
Peak Drain Current ¹⁾	I_{DM}	8.8	A
Avalanche Current	I_{AS}	1.5	A
Avalanche Energy ²⁾	E_{AS}	96	mJ
Reverse Diode dv/dt ⁴⁾	dv/dt	15	V/ns
MOSFET dv/dt Ruggedness ⁵⁾	dv/dt	50	V/ns
Total Power Dissipation	P_{tot}	$T_c = 25^\circ\text{C}$ 5 $T_a = 25^\circ\text{C}$ 0.78	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to + 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Case	$R_{\theta JC}$	25	$^\circ\text{C/W}$
Thermal Resistance from Junction to Ambient ³⁾	$R_{\theta JA}$	160	$^\circ\text{C/W}$

¹⁾ Pulse Test: Pulse Width $\leq 100 \mu\text{s}$, Duty Cycle $\leq 2\%$, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$.

²⁾ Limited by $T_{J(MAX)}$, starting $T_J = 25^\circ\text{C}$, $L = 86 \text{ mH}$, $R_g = 25 \Omega$, $I_D = 1.5 \text{ A}$, $V_{GS} = 10 \text{ V}$.

³⁾ Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

⁴⁾ $V_{DS} = 0 \sim 600 \text{ V}$, $I_{DS} \leq I_D$

⁵⁾ $V_{DS} = 0 \sim 600 \text{ V}$

Characteristics at $T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $I_D = 250\ \mu\text{A}$	$V_{(BR)DSS}$	750	-	-	V
Drain-Source On-State Current at $V_{DS} = 600\ \text{V}$	I_{DSS}	-	-	1	μA
Gate-Source Leakage Current at $V_{GS} = \pm 20\ \text{V}$	I_{GSS}	-	-	± 1	μA
Gate-Source Threshold Voltage at $V_{DS} = V_{GS}$, $I_D = 150\ \mu\text{A}$	$V_{GS(th)}$	2.5	3.2	3.5	V
Drain-Source On-State Resistance at $V_{GS} = 10\ \text{V}$, $I_D = 1\ \text{A}$	$R_{DS(ON)}$	-	-	1.6	Ω
DYNAMIC PARAMETERS					
Gate Resistance at $f = 1\ \text{MHz}$, Open Drain	R_g	-	3.9	6.5	Ω
Input Capacitance at $V_{GS} = 0\ \text{V}$, $V_{DS} = 30\ \text{V}$, $f = 1\ \text{MHz}$	C_{iss}	-	196	300	pF
Output Capacitance at $V_{GS} = 0\ \text{V}$, $V_{DS} = 30\ \text{V}$, $f = 1\ \text{MHz}$	C_{oss}	-	62	100	pF
Reverse Transfer Capacitance at $V_{GS} = 0\ \text{V}$, $V_{DS} = 30\ \text{V}$, $f = 1\ \text{MHz}$	C_{rss}	-	8.5	30	pF
Total Gate Charge at $V_{GS} = 10\ \text{V}$, $V_{DS} = 100\ \text{V}$, $I_D = 1\ \text{A}$	Q_g	-	7	-	nC
Gate-Source Charge at $V_{GS} = 10\ \text{V}$, $V_{DS} = 100\ \text{V}$, $I_D = 1\ \text{A}$	Q_{gs}	-	1.8	-	nC
Gate-Drain Charge at $V_{GS} = 10\ \text{V}$, $V_{DS} = 100\ \text{V}$, $I_D = 1\ \text{A}$	Q_{gd}	-	3.4	-	nC
Turn-On Delay Time at $V_{DD} = 400\ \text{V}$, $I_D = 1.5\ \text{A}$, $V_{GS} = 13\ \text{V}$, $R_g = 10.2\ \Omega$	$t_{d(on)}$	-	7.7	-	ns
Turn-On Rise Time at $V_{DD} = 400\ \text{V}$, $I_D = 1.5\ \text{A}$, $V_{GS} = 13\ \text{V}$, $R_g = 10.2\ \Omega$	t_r	-	5.9	-	ns
Turn-Off Delay Time at $V_{DD} = 400\ \text{V}$, $I_D = 1.5\ \text{A}$, $V_{GS} = 13\ \text{V}$, $R_g = 10.2\ \Omega$	$t_{d(off)}$	-	33	-	ns
Turn-Off Fall Time at $V_{DD} = 400\ \text{V}$, $I_D = 1.5\ \text{A}$, $V_{GS} = 13\ \text{V}$, $R_g = 10.2\ \Omega$	t_f	-	18.2	-	ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S = 1.5\ \text{A}$, $V_{GS} = 0\ \text{V}$	V_{SD}	-	0.9	-	V
Body-Diode Continuous Current	I_S	-	-	5.4	A
Body-Diode Continuous Current, Pulsed	I_{SM}	-	-	8.8	A
Body Diode Reverse Recovery Time at $I_S = 1.5\ \text{A}$, $di/dt = 100\ \text{A} / \mu\text{s}$	t_{rr}	-	197	-	μs
Body Diode Reverse Recovery Charge at $I_S = 1.5\ \text{A}$, $di/dt = 100\ \text{A} / \mu\text{s}$	Q_{rr}	-	1.3	-	μC

Electrical Characteristics Curves

Fig 1 Typ output characteristics

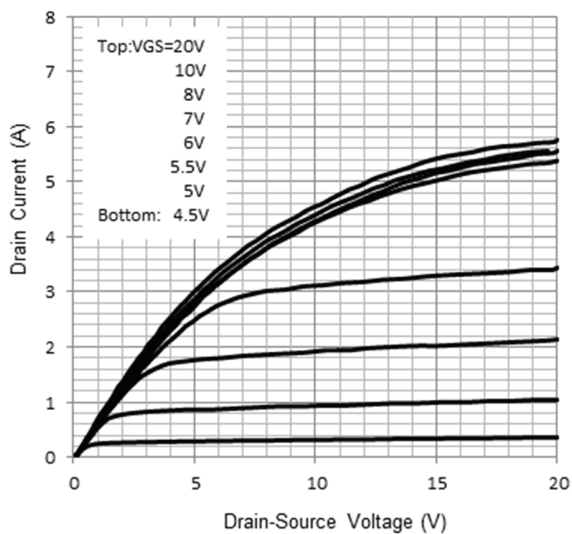


Fig 2 Typ On-state resistance

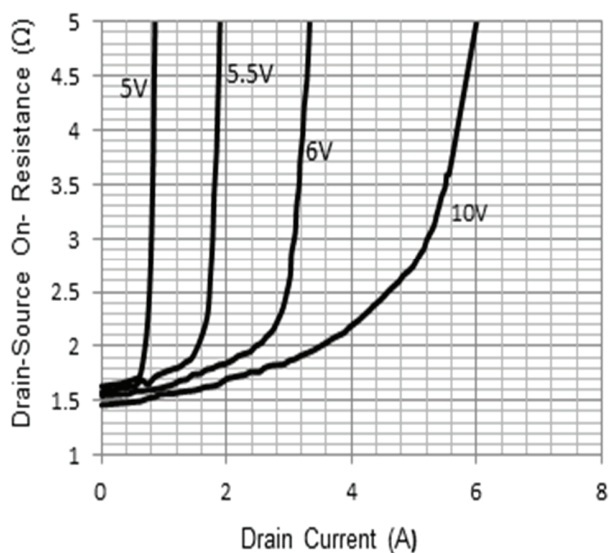


Fig 3 On-state resistance Variation vs T_j

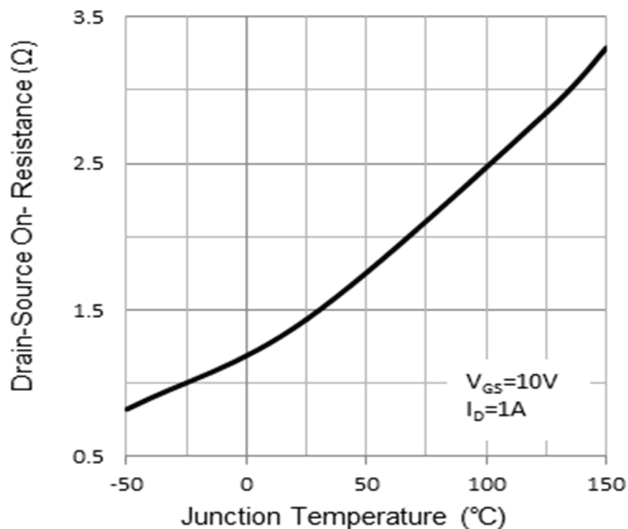
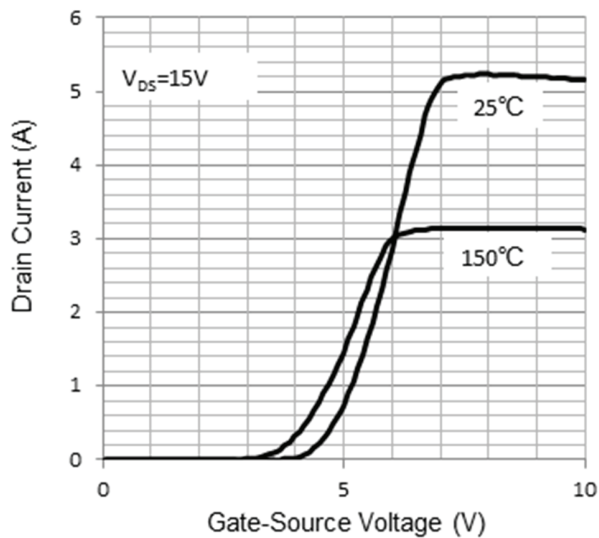


Fig 4 Typ transfer characteristics



Electrical Characteristics Curves

Fig 5 Forward characteristics of body diode

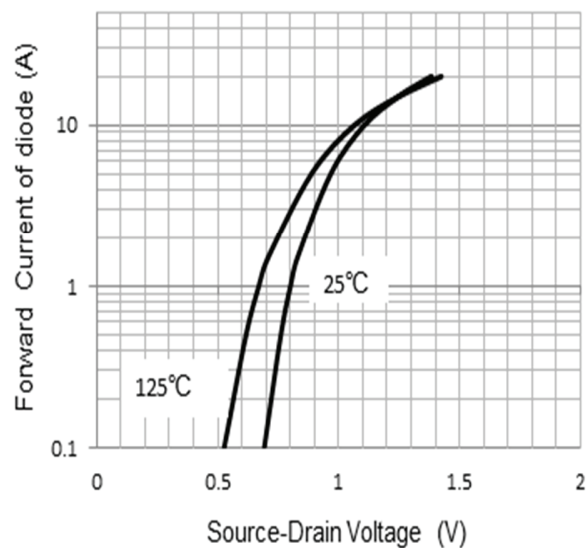


Fig 6 Typ capacitances

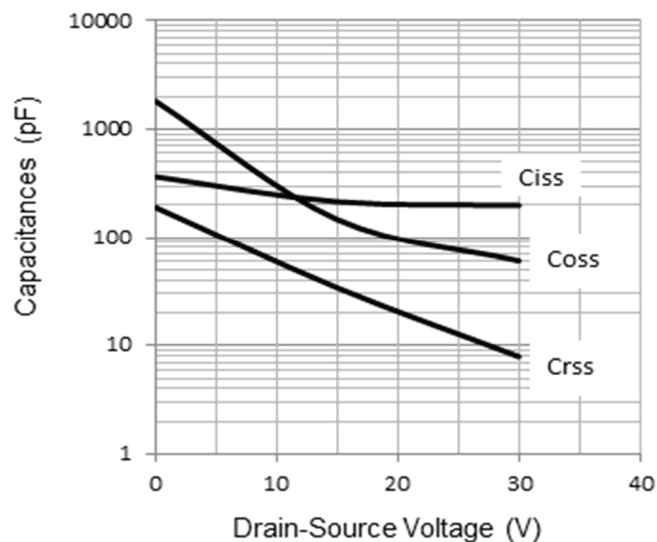


Fig 7 Drain-source Varatio vs Tj

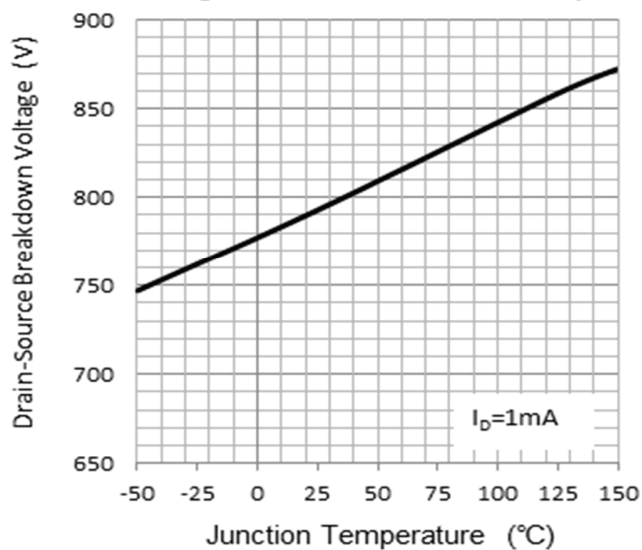
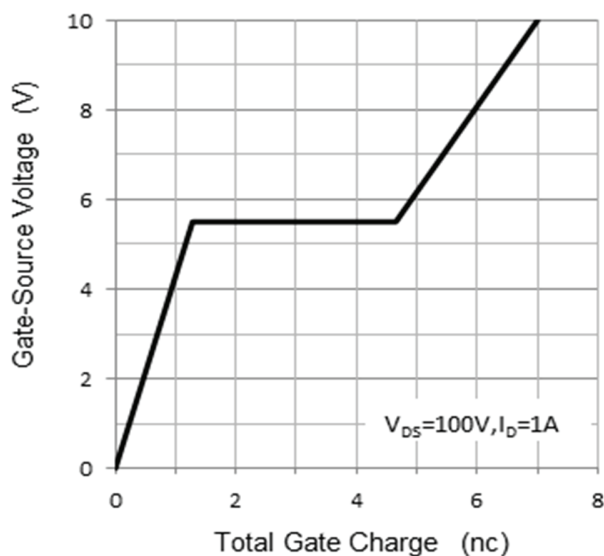


Fig 8 Gate Charge



Test Circuits

Fig.1-1 Switching times test circuit

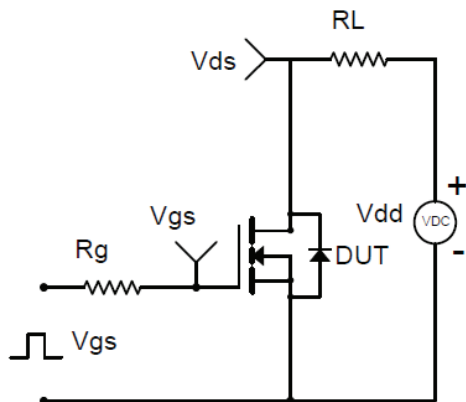


Fig.1-2 Switching Waveform

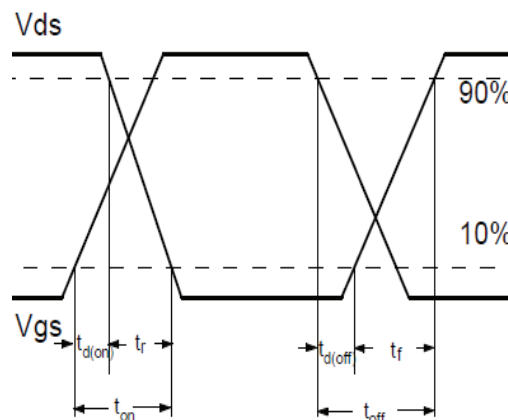


Fig.2-1 Gate charge test circuit

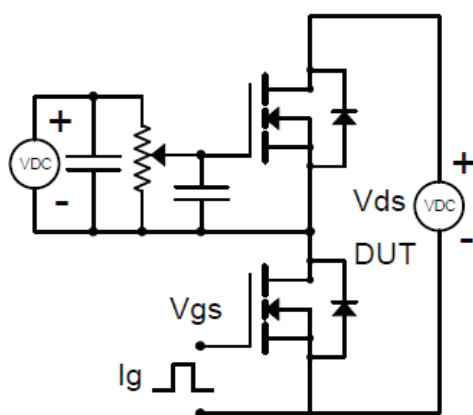


Fig.2-2 Gate charge waveform

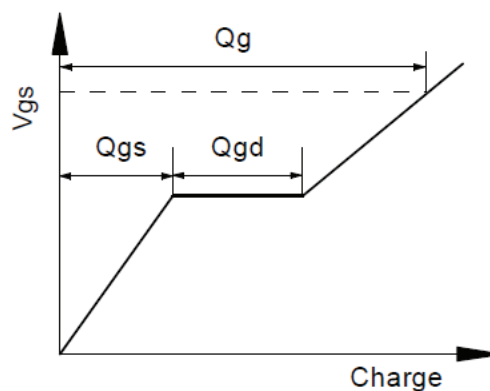


Fig.3-1 Avalanche test circuit

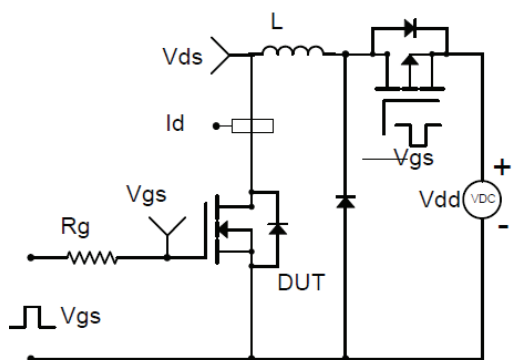
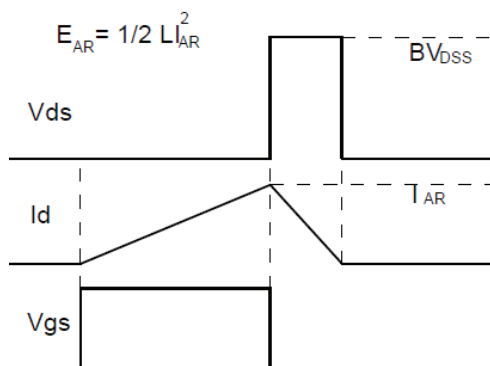
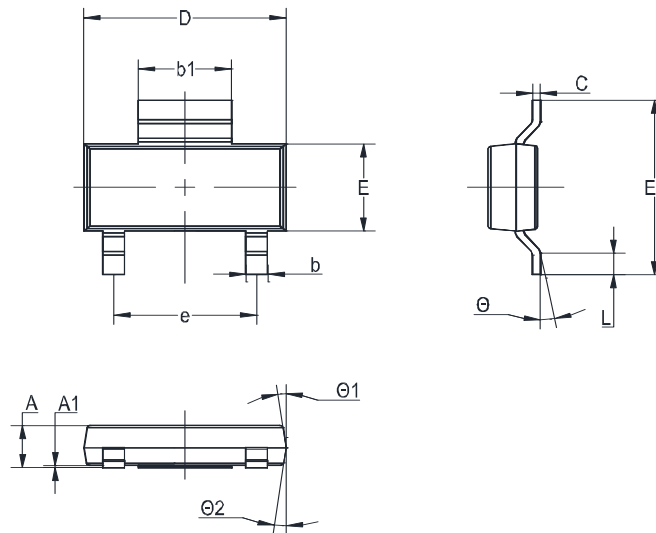


Fig.3-2 Avalanche waveform



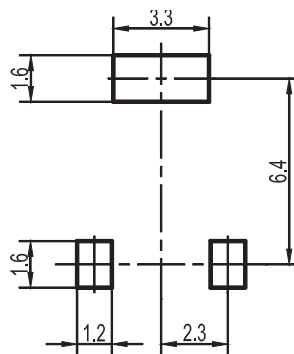
PACKAGE OUTLINE (Dimensions in mm)

SOT-223-2



Unit	A	A1	b	b1	C	D	E	E1	e	L	Θ	Θ1	Θ2
mm	1.8 1.5	0.1 MAX	0.8 0.6	3.1 2.9	0.32 0.22	6.7 6.3	3.7 3.3	7.3 6.7	4.6 TYP	1.1 0.7	10° 0°	7° 0°	7° 0°

Recommended Soldering Footprint



Packing information

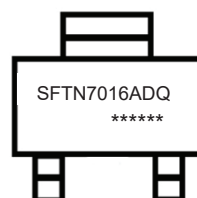
Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-223-2	12	8 ± 0.1	0.315 ± 0.004	330	13	3,000

Marking information

" SFTN7016ADQ " = Part No

" ***** " = Date Code Marking

Font type: Arial



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