

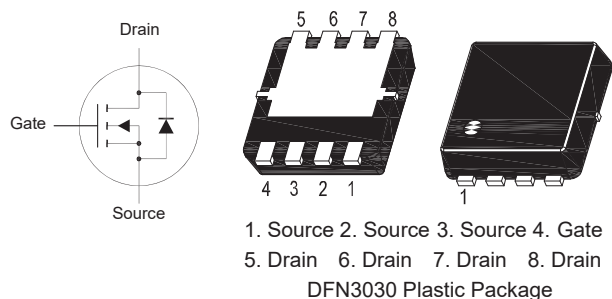
N-Channel Enhancement Mode MOSFET

Features

- Low on-resistance
- Low Switching Charge
- Low Miller Capacitance
- Halogen and Antimony Free(HAF), RoHS compliant

Key Parameters

Parameter	Value	Unit
BV _{DSS}	65	V
R _{DS(ON)} Max	6.5 @ V _{GS} = 10 V	mΩ
	8.5 @ V _{GS} = 4.5 V	
V _{GS(th)} typ	1.7	V
Q _g typ	35 @ V _{GS} = 10 V	nC



Absolute Maximum Ratings (at T_a = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	65	V
Gate-Source Voltage	V _{GS}	± 20	V
Drain Current ¹⁾	I _D	30	A
		22.5	
Peak Drain Current, Pulsed ²⁾	I _{DM}	90	A
Avalanche Current ²⁾	I _{AS}	22.4	A
Avalanche Energy ²⁾	E _{AS}	25.6	mJ
V _{DS} Spike	V _{SPIKE}	80	V
Power Dissipation ³⁾	P _D	38	W
		15	
Power Dissipation ⁴⁾	P _{DSM}	5	W
		3.2	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to + 150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance-Junction to Case	R _{θJC}	3.3	°C/W
Thermal Resistance-Junction to Ambient ⁴⁾	R _{θJA}	25	°C/W
Thermal Resistance-Junction to Ambient ^{4) 5)}	R _{θJA}	55	°C/W

¹⁾ The maximum current rating is package limited.

²⁾ Single pulse width limited by junction temperature T_{J(MAX)}=150°C.

³⁾ The power dissipation P_D is based on T_{J(MAX)}=150°C, using junction to case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

⁴⁾ The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_a=25°C. The Power dissipation P_{DSM} is based on R_{θJA} t ≤ 10 s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

⁵⁾ The R_{θJA} is the sum of the thermal impedance from junction to case R_{θJC} and case to ambient.

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

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $I_D = 250\ \mu\text{A}$	BV_{DSS}	65	-	-	V
Drain-Source Leakage Current at $V_{DS} = 52\ \text{V}$	I_{DSS}	-	-	1	μA
Gate Leakage Current at $V_{GS} = \pm 20\ \text{V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage at $V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	$V_{GS(th)}$	1	-	2.5	V
Drain-Source On-State Resistance at $V_{GS} = 10\ \text{V}$, $I_D = 20\ \text{A}$ at $V_{GS} = 4.5\ \text{V}$, $I_D = 15\ \text{A}$	$R_{DS(on)}$	- -	- -	6.5 8.5	m Ω
DYNAMIC PARAMETERS					
Forward Transconductance at $V_{DS} = 5\ \text{V}$, $I_D = 20\ \text{A}$	g_{FS}	-	33	-	S
Gate Resistance at $V_{GS} = 0\ \text{V}$, $V_{DS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	R_g	-	0.4	2.5	Ω
Input Capacitance at $V_{GS} = 0\ \text{V}$, $V_{DS} = 30\ \text{V}$, $f = 1\ \text{MHz}$	C_{iss}	-	1812	-	pF
Output Capacitance at $V_{GS} = 0\ \text{V}$, $V_{DS} = 30\ \text{V}$, $f = 1\ \text{MHz}$	C_{oss}	-	903	-	pF
Reverse Transfer Capacitance at $V_{GS} = 0\ \text{V}$, $V_{DS} = 30\ \text{V}$, $f = 1\ \text{MHz}$	C_{rss}	-	53	-	pF
Total Gate Charge at $V_{DS} = 15\ \text{V}$, $I_D = 20\ \text{A}$, $V_{GS} = 10\ \text{V}$ at $V_{DS} = 15\ \text{V}$, $I_D = 20\ \text{A}$, $V_{GS} = 4.5\ \text{V}$	Q_g	- -	35 18	- -	nC
Gate Source Charge at $V_{DS} = 15\ \text{V}$, $I_D = 20\ \text{A}$, $V_{GS} = 10\ \text{V}$	Q_{gs}	-	6	-	nC
Gate Drain Charge at $V_{DS} = 15\ \text{V}$, $I_D = 20\ \text{A}$, $V_{GS} = 10\ \text{V}$	Q_{gd}	-	8	-	nC
Turn-On Delay Time at $V_{GS} = 10\ \text{V}$, $V_{DS} = 40\ \text{V}$, $I_D = 20\ \text{A}$, $R_G = 3.6\ \Omega$	t_{on}	-	8.4	-	ns
Turn-On Rise Time at $V_{GS} = 10\ \text{V}$, $V_{DS} = 40\ \text{V}$, $I_D = 20\ \text{A}$, $R_G = 3.6\ \Omega$	t_r	-	21	-	ns
Turn-Off Delay Time at $V_{GS} = 10\ \text{V}$, $V_{DS} = 40\ \text{V}$, $I_D = 20\ \text{A}$, $R_G = 3.6\ \Omega$	t_{off}	-	29	-	ns
Turn-Off Fall Time at $V_{GS} = 10\ \text{V}$, $V_{DS} = 40\ \text{V}$, $I_D = 20\ \text{A}$, $R_G = 3.6\ \Omega$	t_f	-	45	-	ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S = 1\ \text{A}$, $V_{GS} = 0\ \text{V}$	V_{SD}	-	-	1	V
Body-Diode Continuous Current	I_S	-	-	30	A
Body-Diode Continuous Current, Pulsed	I_{SM}	-	-	90	A
Body Diode Reverse Recovery Time at $V_{DD} = 30\ \text{V}$, $I_S = 20\ \text{A}$, $di/dt = 200\ \text{A} / \mu\text{s}$	t_{rr}	-	25	-	ns
Body Diode Reverse Recovery Charge at $V_{DD} = 30\ \text{V}$, $I_S = 20\ \text{A}$, $di/dt = 200\ \text{A} / \mu\text{s}$	Q_{rr}	-	45	-	nC

Electrical Characteristics Curves

Fig. 1 Typical Output Characteristics

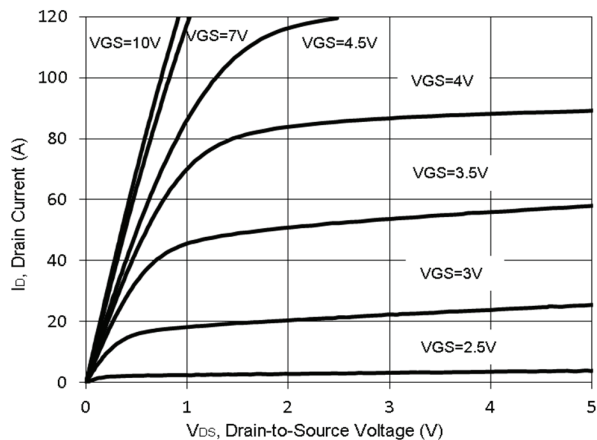


Fig. 2 Typical Transfer Characteristics

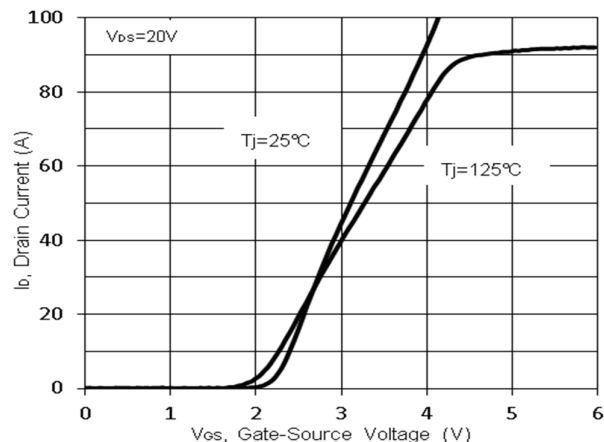


Fig. 3 on-Resistance vs. Gate Voltage

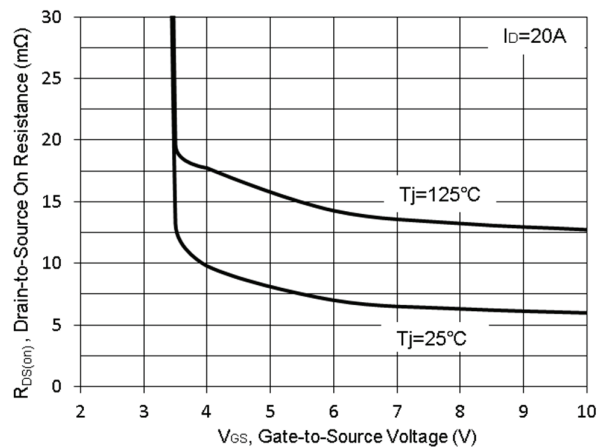


Fig. 4 on-Resistance vs. T_J

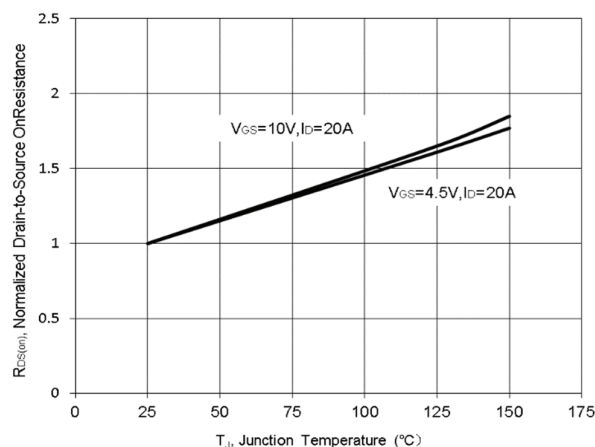


Fig. 5 Drain Source vs. on-Resistance

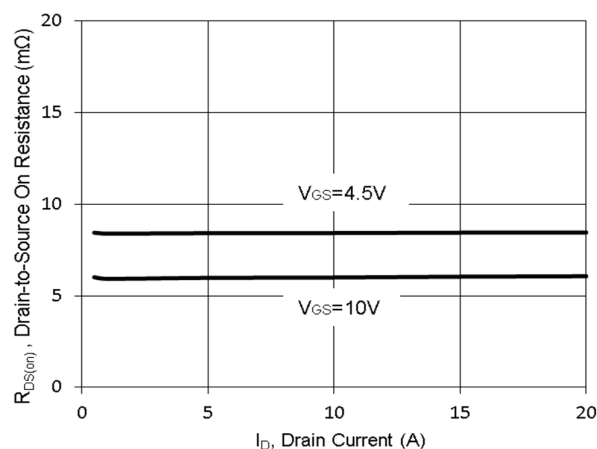
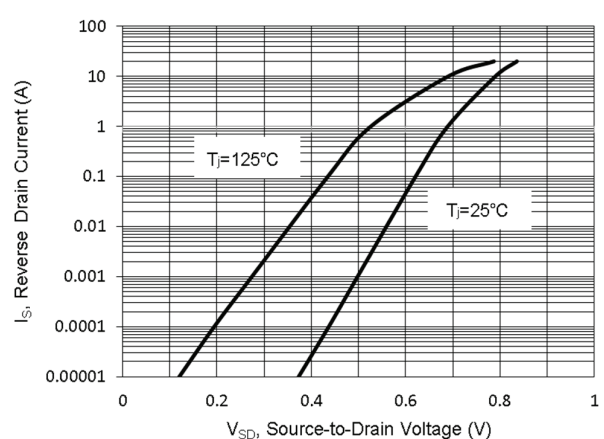


Fig. 6 Typical Body Diode Forward Characteristics



Electrical Characteristics Curves

Fig. 7 $V_{(BR)DSS}$ vs. Junction Temperature

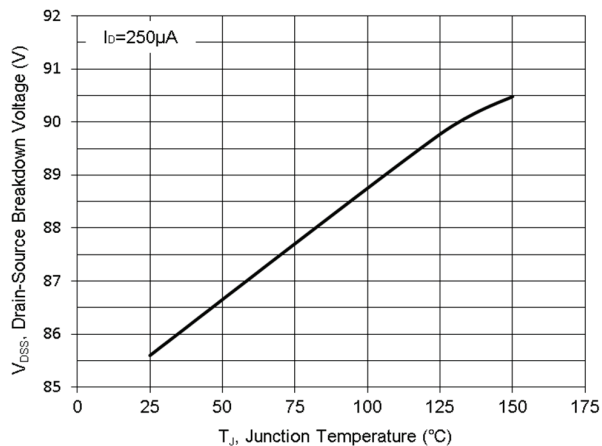


Fig. 8 Gate Threshold Variation vs. T_J

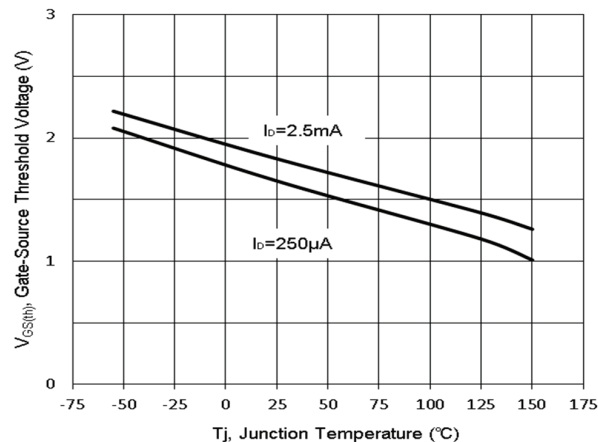


Fig. 9 Typical Junction Capacitance

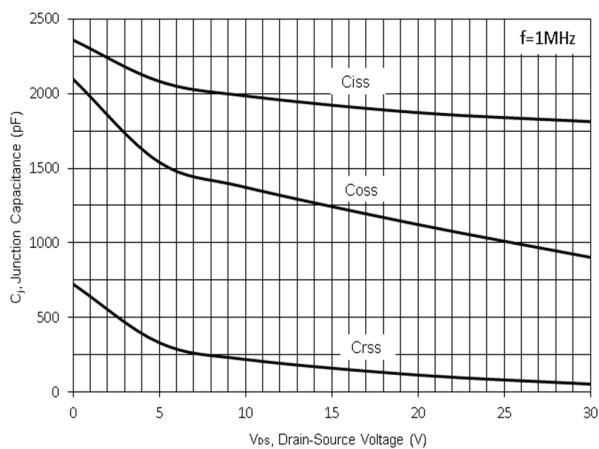


Fig. 10 Gate Charge

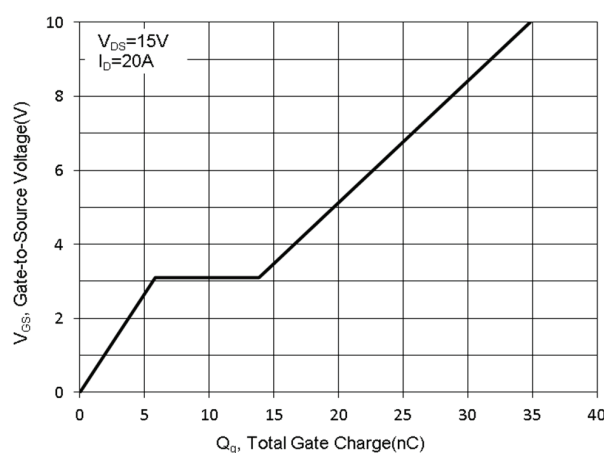
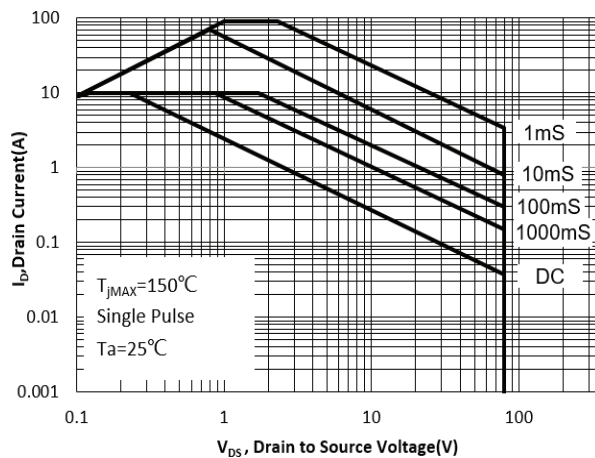


Fig. 11 Safe Operation Area



Test Circuits

Fig.1-1 Switching times test circuit

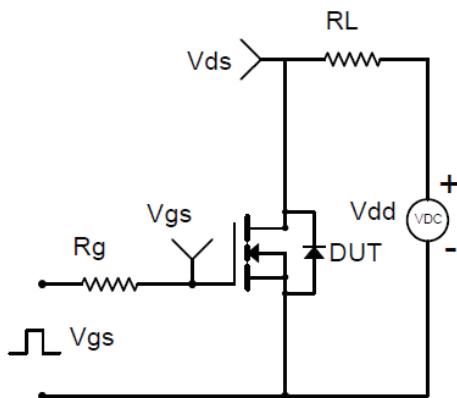


Fig.1-2 Switching Waveform

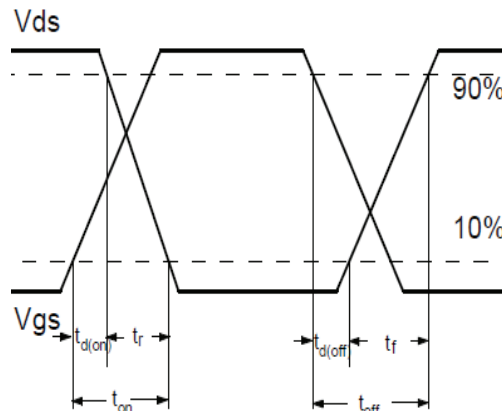


Fig.2-1 Gate charge test circuit

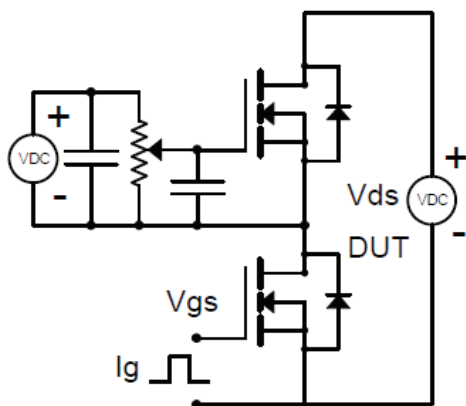


Fig.2-2 Gate charge waveform

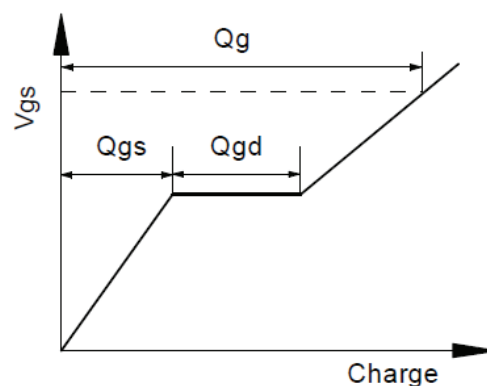


Fig.3-1 Avalanche test circuit

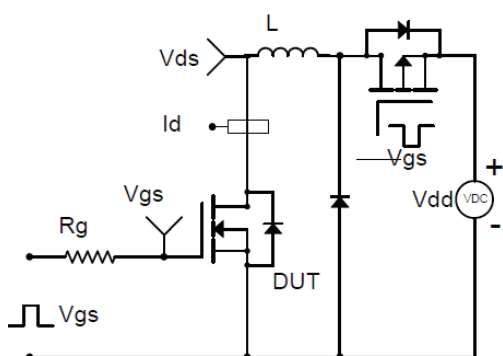
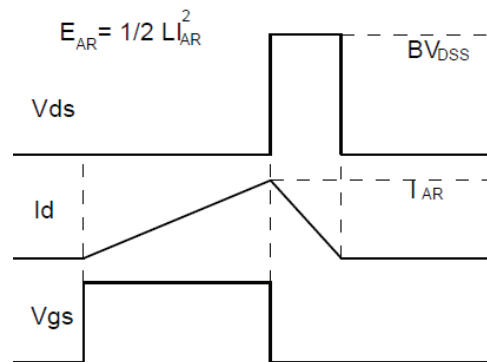
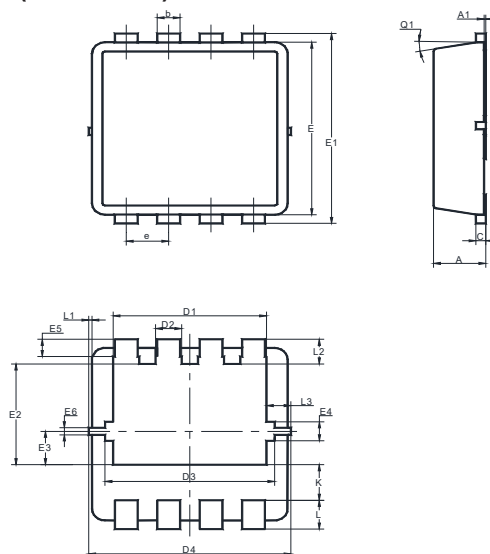


Fig.3-2 Avalanche waveform



Package Outline Dimensions (Units: mm)

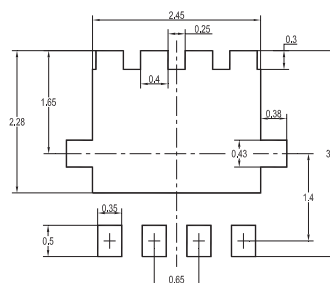
DFN3030



UNIT	A	A1	b	c	D1	D2	D3	D4	E	E1	E2	E3	E4
mm	0.9	0.05	0.35	0.25	2.6	0.5	2.7	3.2	3.1	3.3	1.85	0.68	0.43
	0.7	0	0.24	0.1	2.4	0.3	2.5	3	2.9	3.1	1.65	0.48	0.23

UNIT	E5	E6	e	K	L	L1	L2	L3	θ1
mm	0.4	0.25	0.7	0.72	0.5	0.1	0.53	0.475	12°
	0.2	0.15	0.6	0.52	0.3	0	0.33	0.275	0°

Recommended Soldering Footprint



Packing information

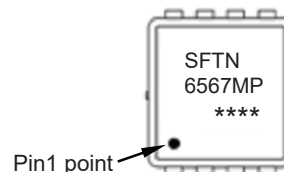
Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
DFN3030	8	8 ± 0.1	0.157 ± 0.004	330	13	5,000

Marking information

" SFTN6567MP " = Part No.

" **** " = Date Code Marking

Font type: Arial



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