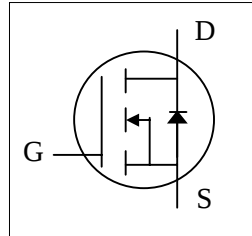


- ▼ 100% R_g & UIS Test
- ▼ Simple Drive Requirement
- ▼ Lower On-resistance
- ▼ RoHS Compliant & Halogen-Free

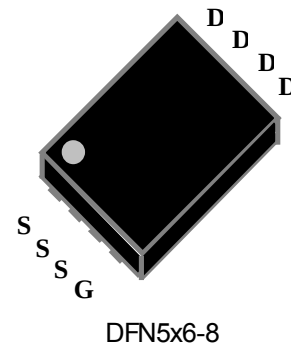


BV_{DSS}	150V
$R_{DS(ON)}$	52m Ω

Description

RSTN150N56A1 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The DFN5x6 package is special for DC-DC converters application and the foot print is compatible with SO-8 with backside heat sink and lower profile.



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Drain Current, V_{GS} @ 10V	21	A
$I_D@T_C=100^\circ\text{C}$	Drain Current, V_{GS} @ 10V	13.8	A
$I_D@T_A=25^\circ\text{C}$	Drain Current, V_{GS} @ 10V ³	6.5	A
$I_D@T_A=70^\circ\text{C}$	Drain Current, V_{GS} @ 10V ³	5.2	A
I_{DM}	Pulsed Drain Current ¹	60	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	56.8	W
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	5	W
E_{AS}	Single Pulse Avalanche Energy ⁴	32	mJ
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	2.2	$^\circ\text{C}/\text{W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient ³	25	$^\circ\text{C}/\text{W}$

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	150	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =10.5A	-	-	52	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	5	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =10.5A	-	20	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =120V, V _{GS} =0V	-	-	25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge ⁵	I _D =10.5A	-	31	49.6	nC
Q _{gs}	Gate-Source Charge ⁵	V _{DS} =75V	-	12	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge ⁵	V _{GS} =10V	-	10	-	nC
t _{d(on)}	Turn-on Delay Time ⁵	V _{DS} =75V	-	15	-	ns
t _r	Rise Time ⁵	I _D =10.5A	-	26	-	ns
t _{d(off)}	Turn-off Delay Time ⁵	R _G =1.6Ω	-	22	-	ns
t _f	Fall Time ⁵	V _{GS} =10V	-	4	-	ns
C _{iss}	Input Capacitance ⁵	V _{GS} =0V	-	1680	2688	pF
C _{oss}	Output Capacitance ⁵	V _{DS} =75V	-	90	-	pF
C _{rss}	Reverse Transfer Capacitance ⁵	f=1.0MHz	-	15	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1	2	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =10.5A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Reverse Recovery Time ⁵	I _S =10.5A, V _{GS} =0V,	-	76	-	ns
Q _{rr}	Reverse Recovery Charge ⁵	dI/dt=100A/μs	-	255	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board, t ≤10sec; 60°C/W at steady state.
- 4.Starting T_j=25°C , V_{DD}=50V , L=1mH , R_G=25Ω
- 5.Guaranteed by design.

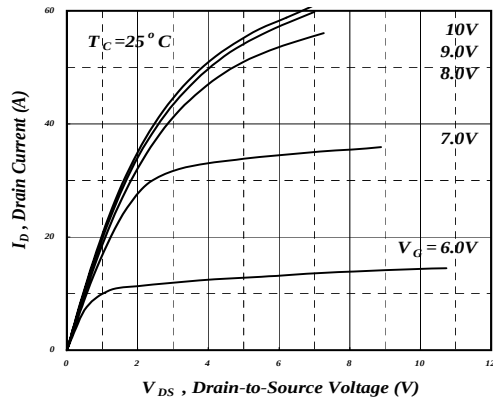


Fig 1. Typical Output Characteristics

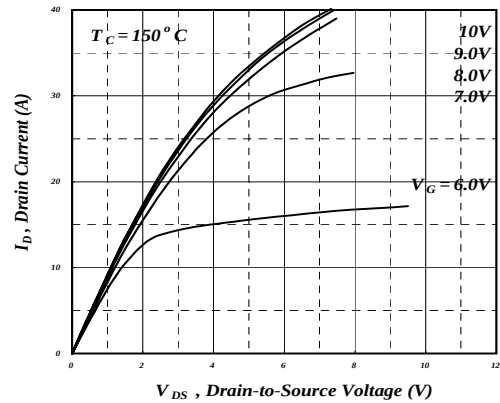


Fig 2. Typical Output Characteristics

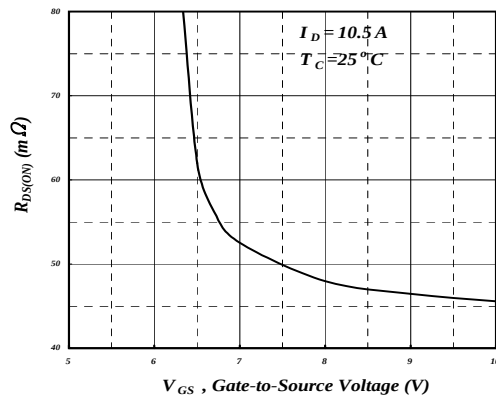


Fig 3. On-Resistance v.s. Gate Voltage

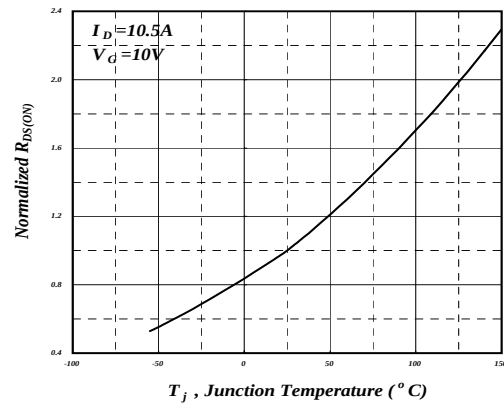


Fig 4. Normalized On-Resistance v.s. Junction Temperature

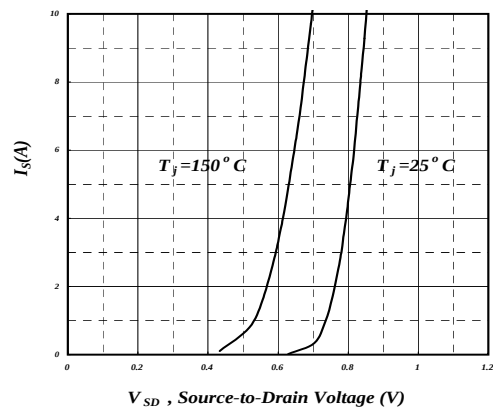


Fig 5. Forward Characteristic of Reverse Diode

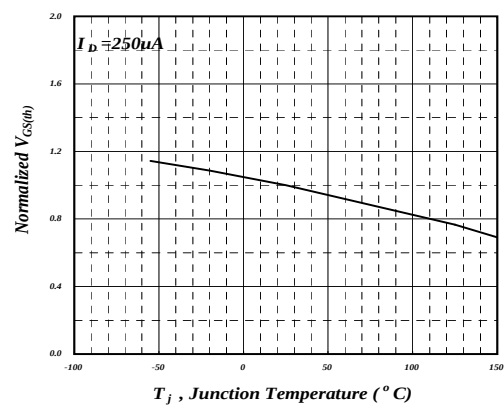


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

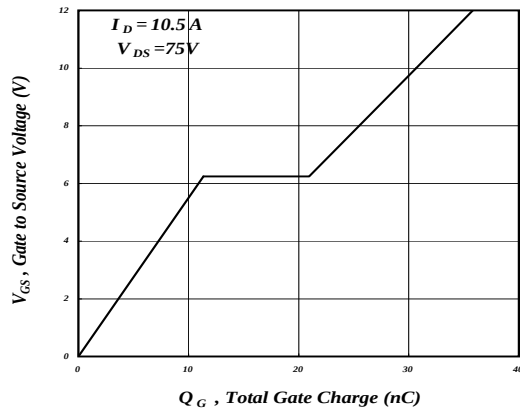


Fig 7. Gate Charge Characteristics

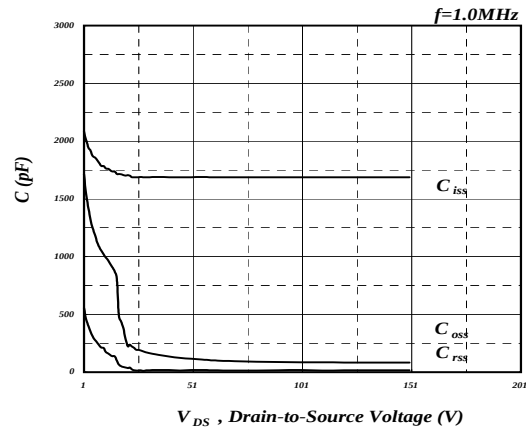


Fig 8. Typical Capacitance Characteristics

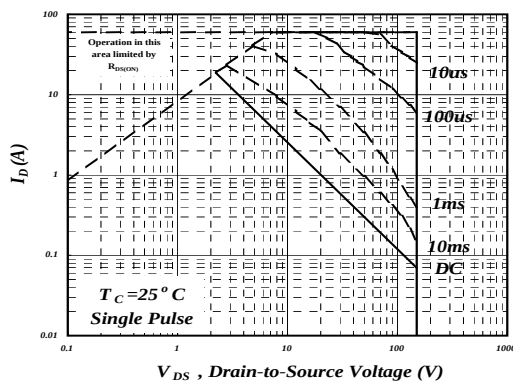


Fig 9. Maximum Safe Operating Area

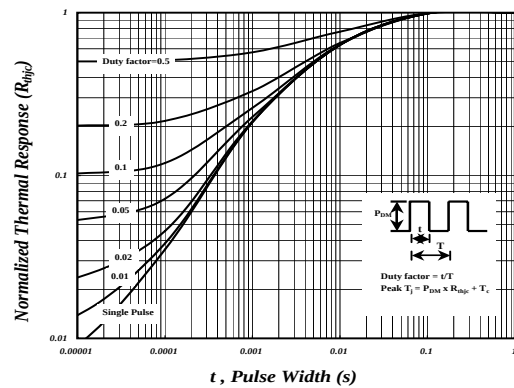


Fig 10. Effective Transient Thermal Impedance

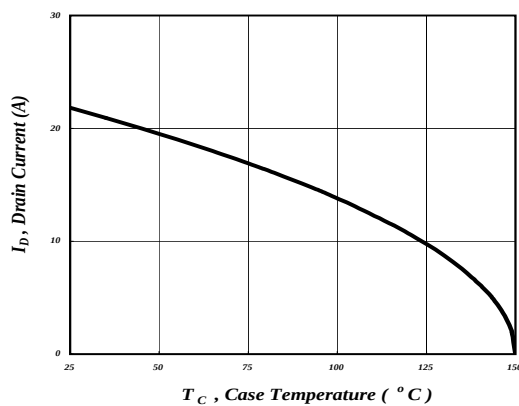


Fig 11. Drain Current v.s. Case Temperature

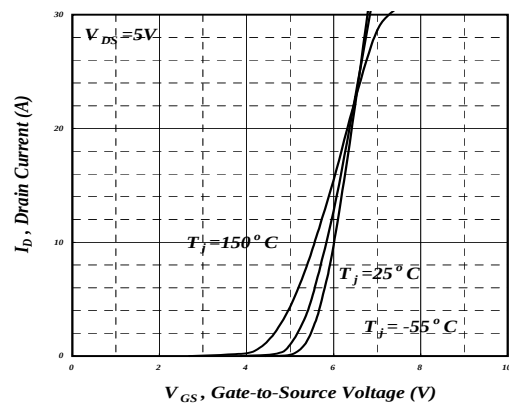


Fig 12. Transfer Characteristics

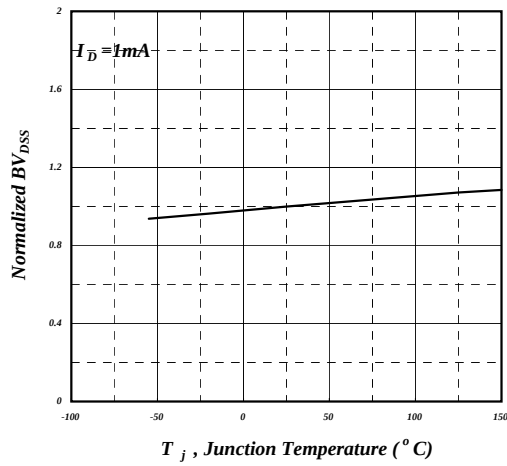


Fig 13. Normalized BV_{DSS} v.s. Junction Temperature

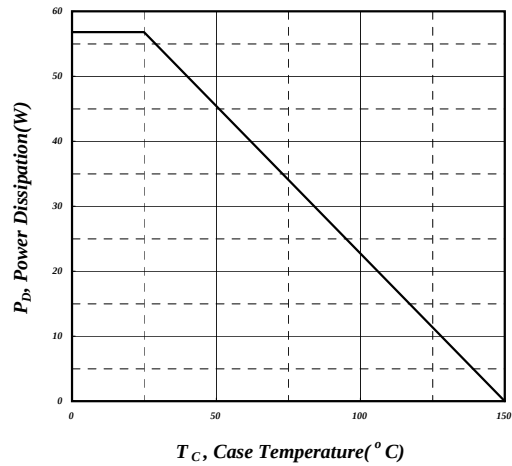


Fig 14. Total Power Dissipation

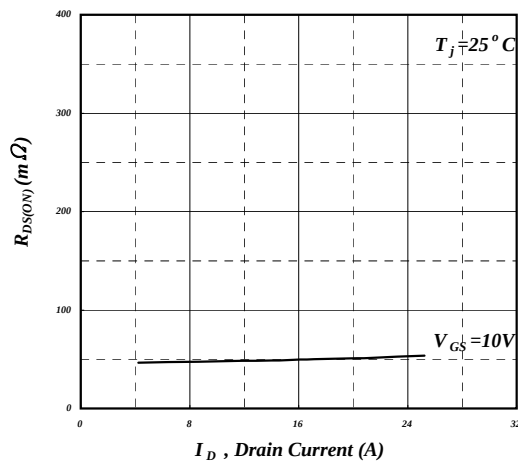
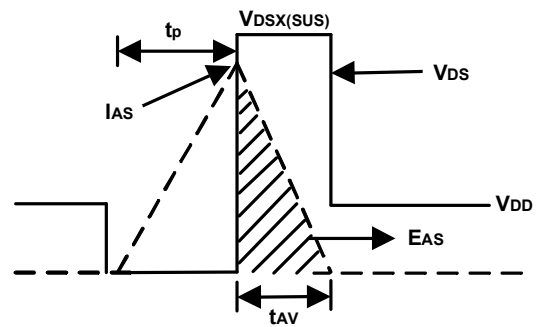
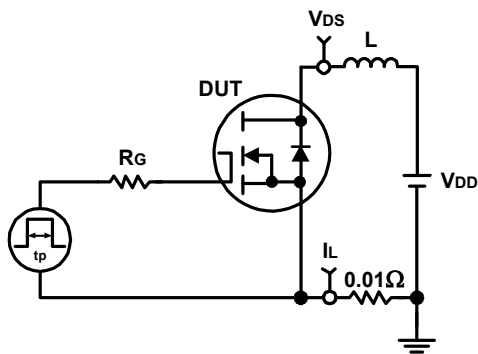
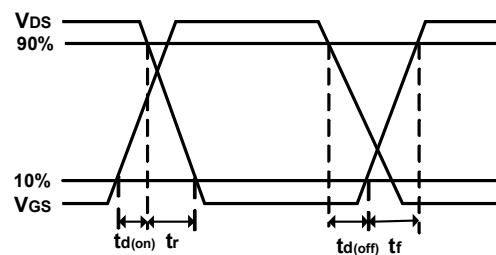
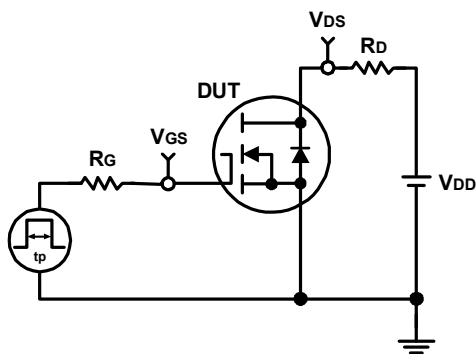


Fig 15. Typ. Drain-Source on State Resistance

Avalanche Test Circuit and Waveforms

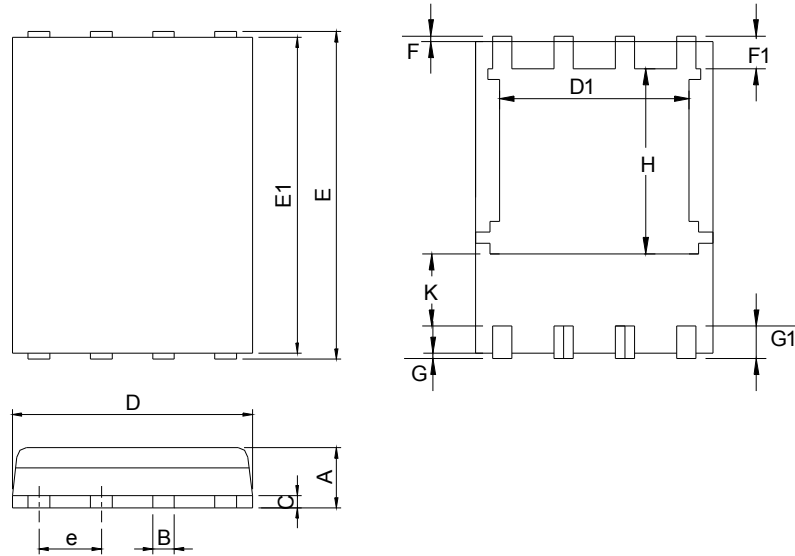


Switching Time Test Circuit and Waveforms



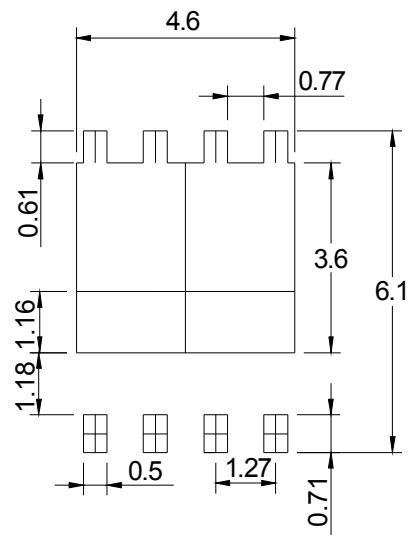
Package Information

DFN5x6-8



SYMBOL	DFN5x6-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.90	1.20	0.035	0.047
B	0.3	0.51	0.012	0.020
C	0.19	0.25	0.007	0.010
D	4.80	5.30	0.189	0.209
D1	4.00	4.40	0.157	0.173
E	5.90	6.20	0.232	0.244
E1	5.50	5.80	0.217	0.228
e	1.27 BSC		0.050 BSC	
F	0.05	0.30	0.002	0.012
F1	0.35	0.75	0.014	0.030
G	0.05	0.30	0.002	0.012
G1	0.35	0.75	0.014	0.030
H	3.34	3.9	0.131	0.154
K	0.762	-	0.03	-

RECOMMENDED LAND PATTERN



UNIT: mm

Note : 1.Dimension D, D1,D2 and E1 do not include mold flash or protrusions.
Mold flash or protrusions shall not exceed 10 mil.