RSTNG30N015A1

N-Channel Enhancement Mode MOSFET

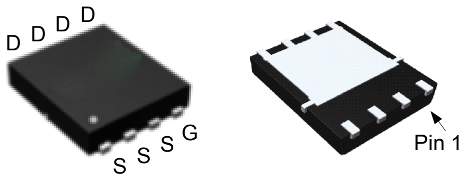
Features

- 30V/150A,
  $R_{DS(ON)}$=1.4mΩ (typ.) @ V_{GS}=10V
  $R_{DS(ON)}$=1.9mΩ (typ.) @ V_{GS}=4.5V
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lower Q_g and Q_{gd} for high-speed switching
- Lower $R_{DS(ON)}$ to Minimize Conduction Losses
- Lead Free and Green Devices Available (RoHS Compliant)

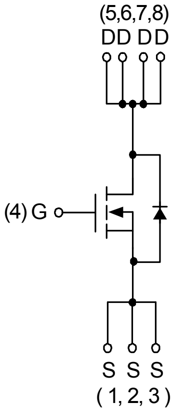
Applications

- For E-cigrate Application.
- For Auto Model Airplane.
- Synchronous Rectifier for Server.

Pin Description



DFN5x6A-8_EP



N-Channel MOSFET

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	
I_S	Diode Continuous Forward Current	T_C=25°C	66	A
I_D [a]	Continuous Drain Current	T_C=25°C	150*	
		T_C=100°C	150*	
I_{DM} [b]	Pulsed Drain Current	T_C=25°C	400	
P_D	Maximum Power Dissipation	T_C=25°C	73.5	W
		T_C=100°C	29.4	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	1.7	°C/W
I_D [c]	Continuous Drain Current	T_A=25°C	29	A
		T_A=70°C	23	
P_D [c]	Maximum Power Dissipation	T_A=25°C	2	W
		T_A=70°C	1.3	
$R_{\theta JA}$ [c]	Thermal Resistance-Junction to Ambient	$t \leq 10s$	23	°C/W
		Steady State	60	
I_{AS} [d]	Avalanche Current, Single pulse	L=0.1mH	76	A
E_{AS} [d]	Avalanche Energy, Single pulse	L=0.1mH	288	mJ

Note a,*：Max. continue current is limited by bonding wire.
Note b：Pulse width is limited by max. junction temperature.
Note c：$R_{\theta JA}$ steady state t=999s.
Note d：UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_j=25°C).

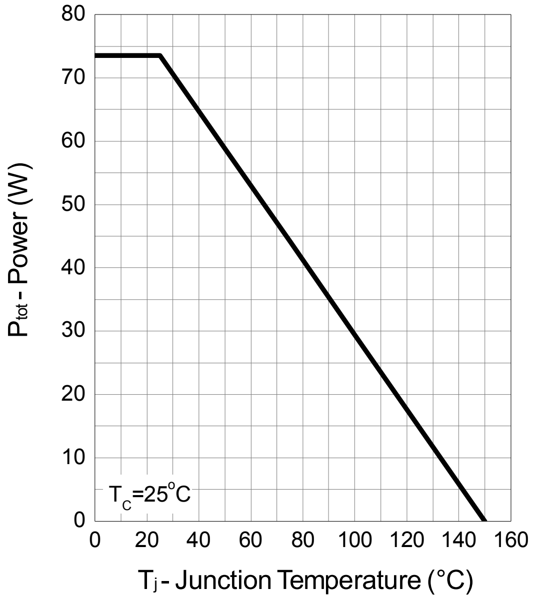
Electrical Characteristics (T$_A$ = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30	-	-	V
BV_{DSSt}	Drain-Source Breakdown Voltage (transient)	VGS=0V, $I_{D(aval)}$=51A T_{case}=25°C, $t_{transient}$=100ns	34	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.0	1.5	2.0	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ ^{e}	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=25A	-	1.4	1.7	mΩ
		V_{GS}=4.5V, I_{DS}=15A	-	1.9	2.4	
Gfs	Forward Transconductance	V_{DS}=5V, I_{DS}=20A	-	30	-	S
Diode Characteristics						
V_{SD} ^{e}	Diode Forward Voltage	I_{SD}=25A, V_{GS}=0V	-	0.75	1.1	V
t_{rr}	Reverse Recovery Time	I_{SD}=25A, dI_{SD}/dt=100A/μs V_{DS}=15V	-	55.2	-	ns
t_a	Charge Time		-	25.5	-	
t_b	Discharge Time		-	30	-	
Q_{rr}	Reverse Recovery Charge		-	52.5	-	nC
Dynamic Characteristics						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	1	2.2	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	-	3195	-	pF
C_{oss}	Output Capacitance		-	1550	-	
C_{rss}	Reverse Transfer Capacitance		-	160	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=1Ω	-	18.3	-	ns
t_r	Turn-on Rise Time		-	10.7	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	40	-	
t_f	Turn-off Fall Time		-	23	-	
Gate Charge Characteristics						
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_{DS}=25A	-	48.5	63	nC
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=4.5V, I_{DS}=25A	-	23	-	
Q_{gth}	Threshold Gate Charge		-	4.3	-	
Q_{gs}	Gate-Source Charge		-	9	-	
Q_{gd}	Gate-Drain Charge		-	6.7	-	

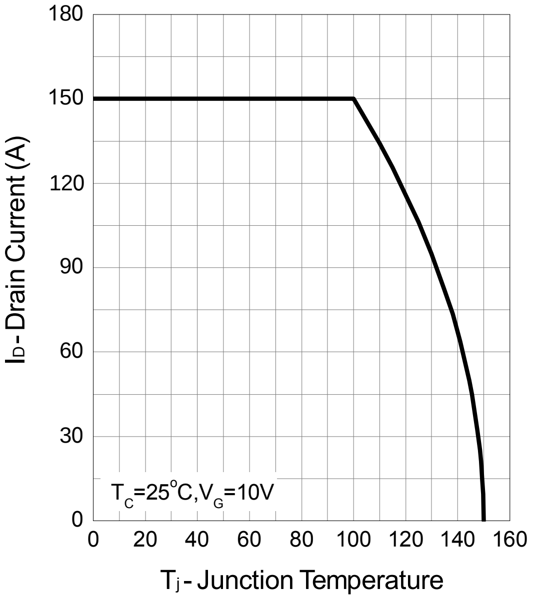
Note e：Pulse test ; pulse width≤300μs, duty cycle≤2%.

Typical Operating Characteristics

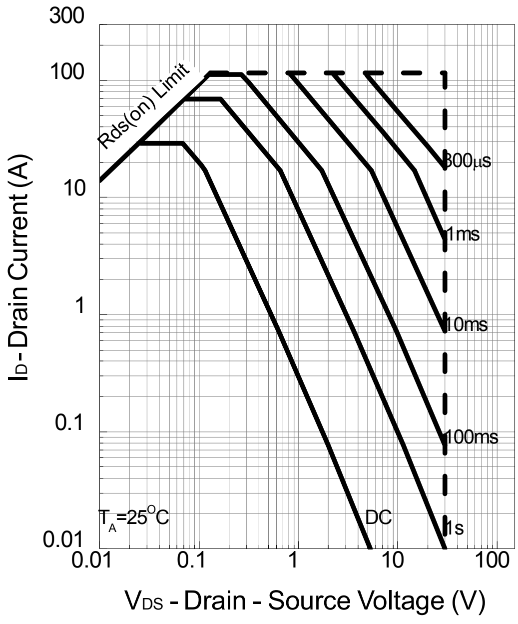
Power Dissipation



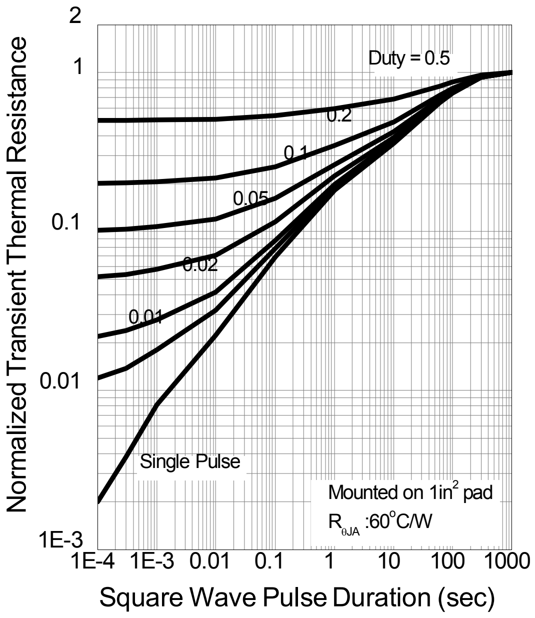
Drain Current



Safe Operation Area

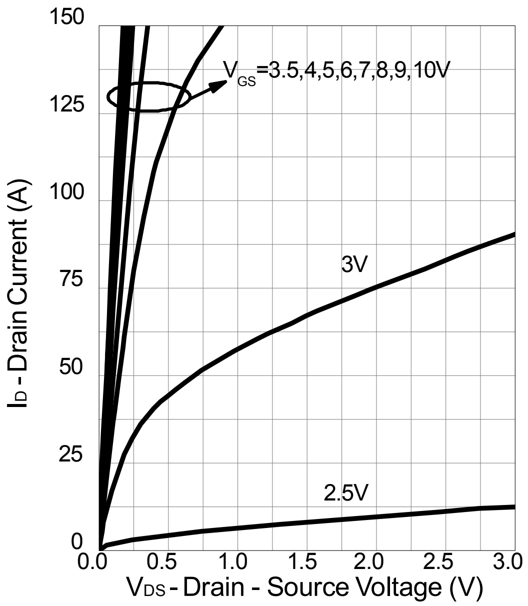


Thermal Transient Impedance

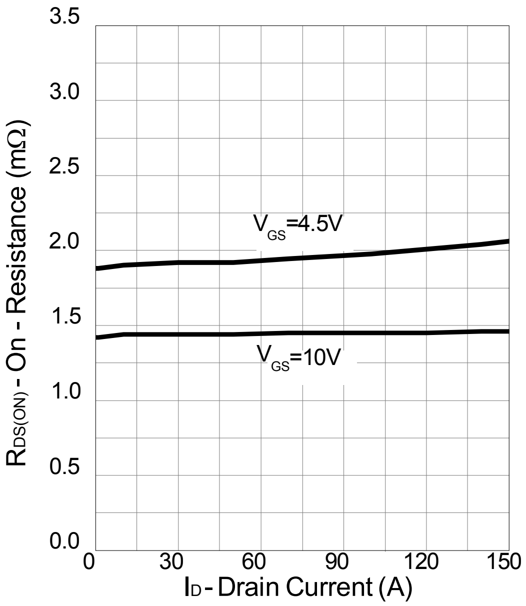


Typical Operating Characteristics (Cont.)

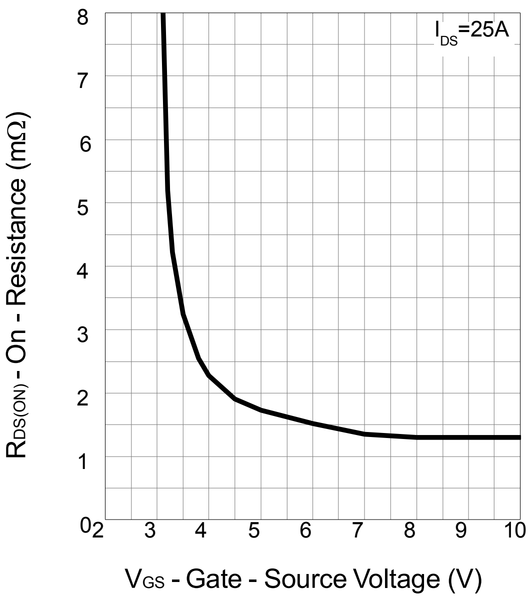
Output Characteristics



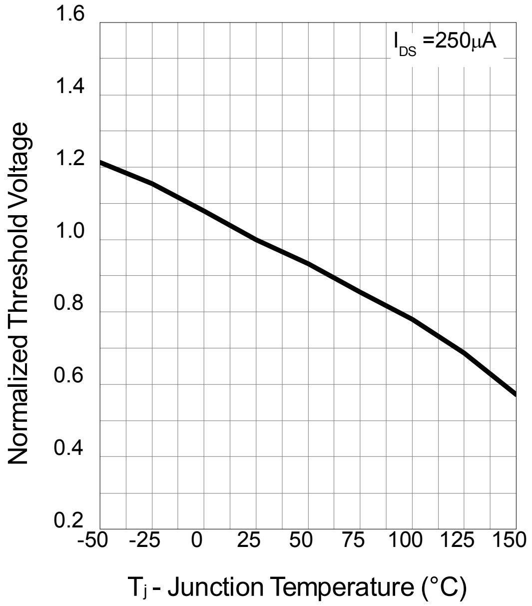
Drain-Source On Resistance



Gate-Source On Resistance

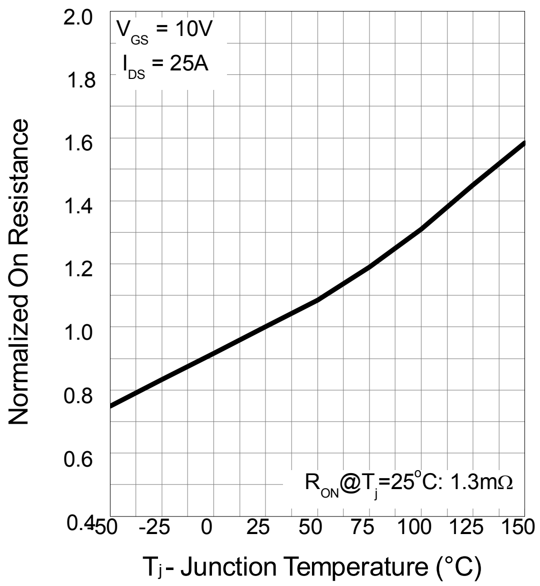


Gate Threshold Voltage

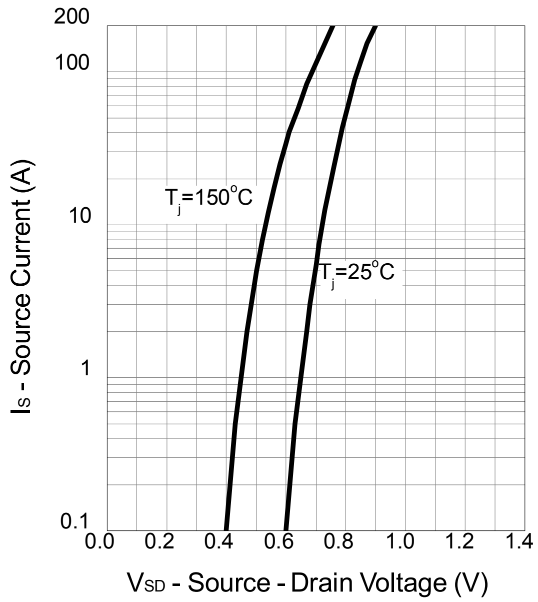


Typical Operating Characteristics (Cont.)

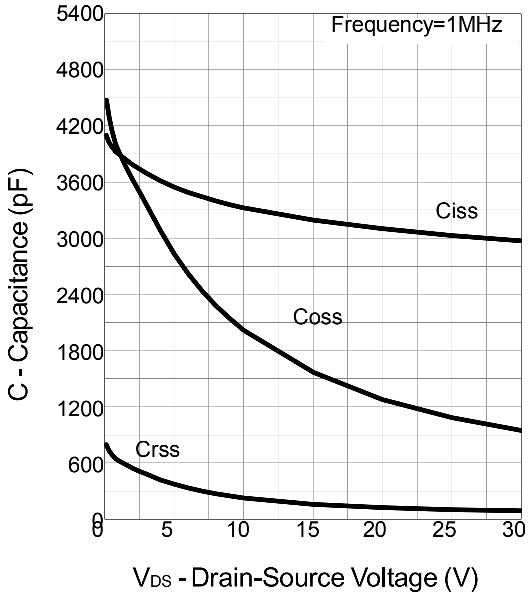
Drain-Source On Resistance



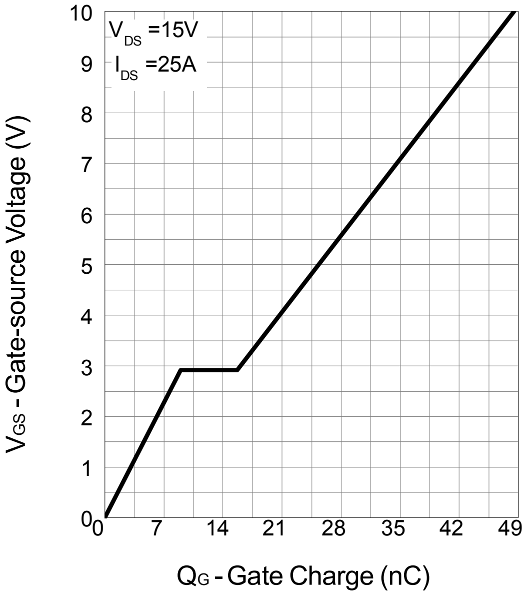
Source-Drain Diode Forward



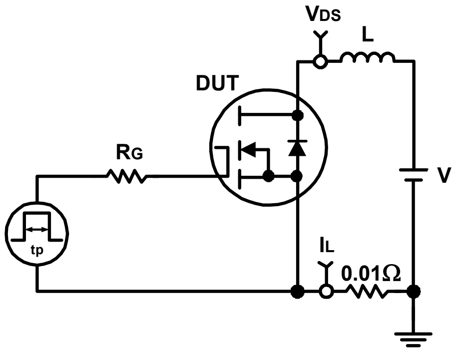
Capacitance

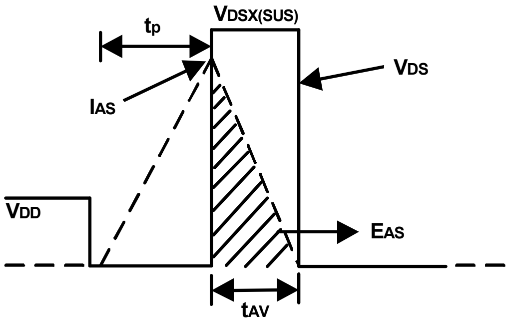


Gate Charge

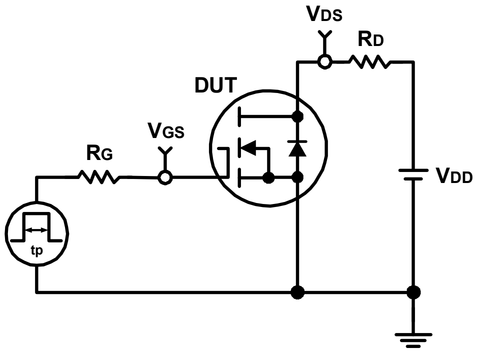


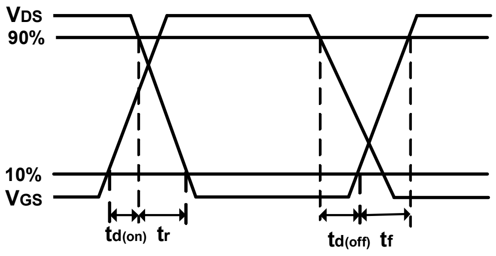
Avalanche Test Circuit and Waveforms





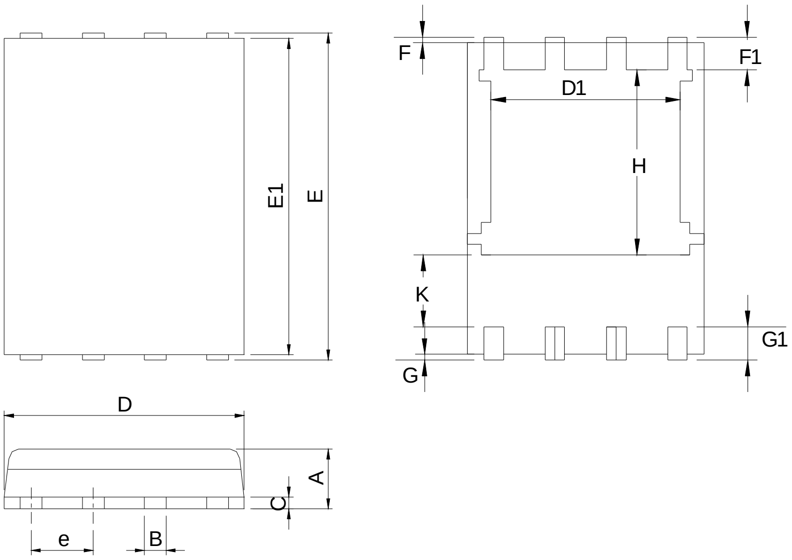
Switching Time Test Circuit and Waveforms





Package Information

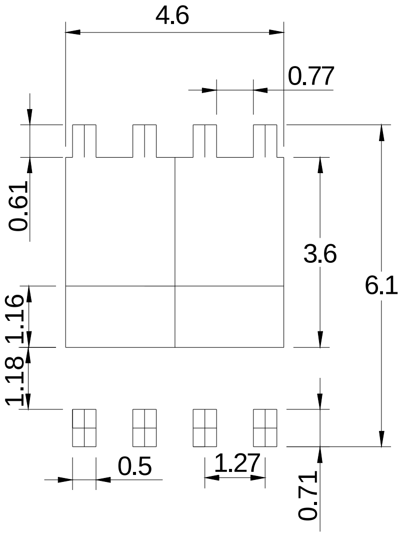
DFN5x6-8



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	-

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

RECOMMENDED LAND PATTERN



UNIT: mm