

H25N60F

Super Junction N-Channel MOSFET

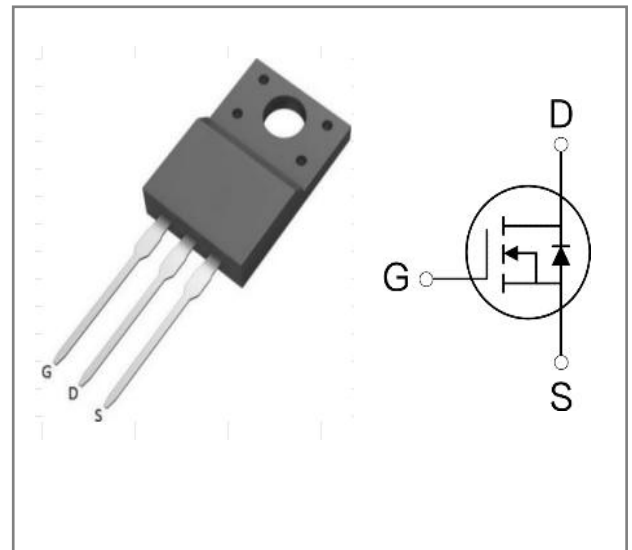
VDSS	R _{DS(ON)} (Typ)	ID
600V	120mΩ	25A

Features:

- Fast switching speed
- 100% avalanche tested
- Improved dv/dt capability
- Enhanced Avalanche Ruggedness
- Lead Free

Applications:

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC-DC Switching Power Supply



Ordering Information

Part Number	Package	Marking	Packing	Qty.
H25N60F	TO-220F	H25N60F	Tube	50 PCS

Absolute Maximun Ratings (Tc= 2 5℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
VDS	Drain-to-Source Voltage	600	V
VGS	Gate- to- Source Voltage	±30	V
ID	Continuous Drain Current TC=25℃	25	A
	Continuous Drain Current TC=125℃	11.2	
IDM	Pulsed Drain Current	75	
PD	Power Dissipation	35	W
EAS	Single Pulse Avalanche Engergy L = 20mH, RG = 25 Ω, TC=25℃	500	mJ
TJ, TSTG	Operating Junction and Storage Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ	Max	Unit
RθJC	Thermal Resistance Junction-Case	--	3.8	℃/ W
RθJA	Thermal Resistance Junction-Ambient	--	62.5	℃/ W

Electrical Characteristics (TJ= 25℃ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
V(BR)DSS	Drain- Source Breakdown Voltage	600	--	--	V	VGS=0V,ID=250μA
IDSS	Zero Gate Voltage Drain Current (25℃)	--	--	1	μA	VDS=600V,VGS=0V
	Zero Gate Voltage Drain Current (100℃)	--	--	100	μA	VDS=600V,VGS=0V
IGSS	Gate to Source Forward Leakage	--	--	100	nA	VGS=30V ,VDS=0V
	Gate to Source Reverse Leakage	--	--	-100		VGS=-30V ,VDS=0V
VGS(TH)	Gate Threshold Voltage	3	-	5	V	VGS=VDS,ID=250μA
RDS(on)	Static Drain- to- Source On-Resistance	--	120	140	mΩ	VGS=10V,ID=12A

Dynamic Electrical Characteristics

Ciss	Input Capacitance	--	1700	--	pF	VGS=0V VDS=50V f=1MHz
Coss	Output Capacitance	--	440	--		
Crss	Reverse Transfer Capacitance	--	24	--		
Qg	Total Gate Charge	--	40	--	nC	VDS=480 ID=12A VGS=10V
Qgs	Gate- to- Source Charge	--	10.5	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	14	--		

Switching Characteristics

td(ON)	Turn- on Delay Time	--	18	--	nS	VDS=400V ID=12A RG=3.0Ω VGS=10V
trise	Rise Time	--	10	--		
td(OFF)	Turn- OFF Delay Time	--	75	--		
tfall	Fall Time	--	9	--		

Source- Drain Diode Characteristics

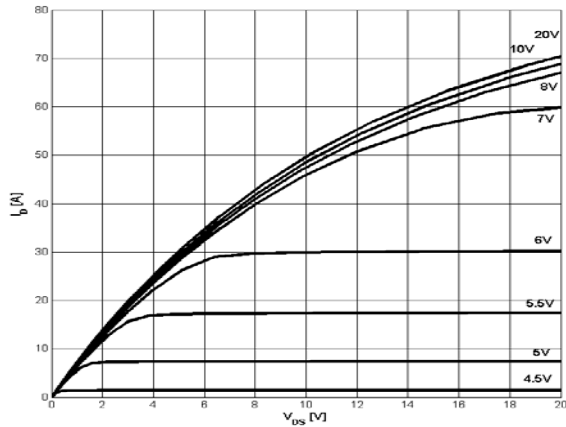
VSD	Diode Forward Voltage	--	--	1.4	V	IF=12A,VGS=0V
trr	Reverse Recovery Time	--	160	--	nS	VR=400V,IF=12A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	4.8	--	uC	

Notes:

- * 1. Repetitive rating, pulse width limited by maximum junction temperature.
- * 2. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%

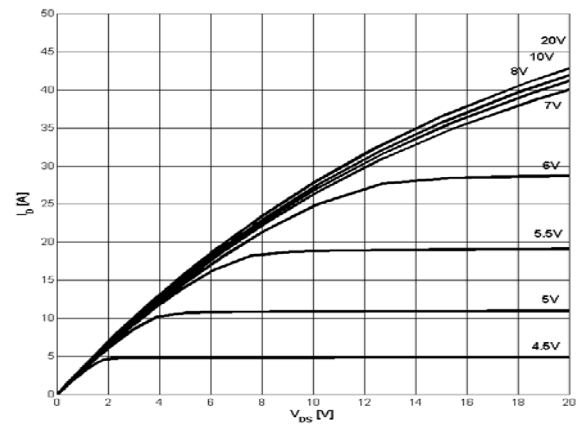
Typical Characteristics

Figure 1: Typ. Output Characteristics



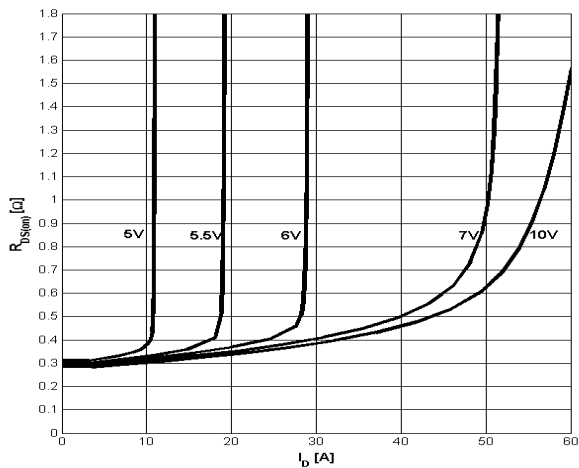
$$I_D = f(V_{DS}); T_j = 25^\circ\text{C}; \text{parameter: } V_{GS}$$

Figure 2: Typ. Output Characteristics



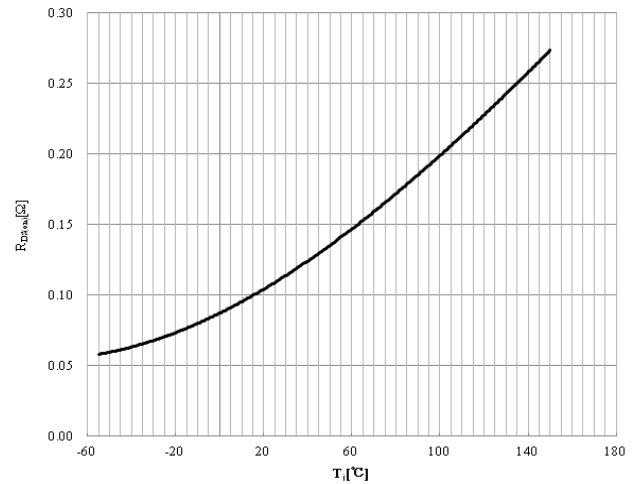
$$I_D = f(V_{DS}); T_j = 125^\circ\text{C}; \text{parameter: } V_{GS}$$

Figure 3: Typ. Drain-Source On-State Resistance



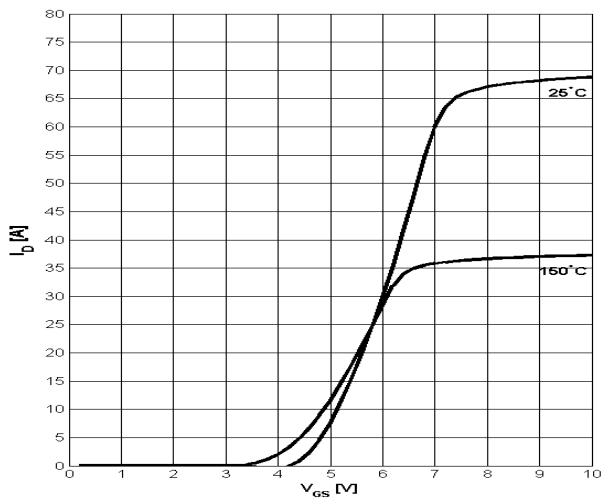
$$R_{DS(ON)} = f(I_D); T_j = 125^\circ\text{C}; \text{parameter: } V_{GS}$$

Figure 4: Typ. Drain-Source On-State Resistance



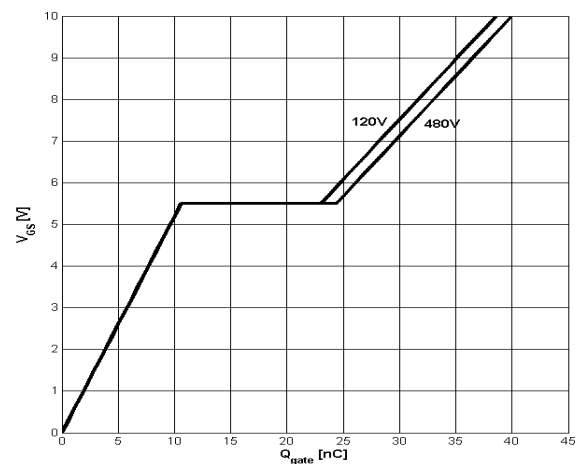
$$R_{DS(ON)} = f(T_j); I_D = 12\text{A}; V_{GS} = 10\text{V}$$

Figure 5: Typ. Transfer Characteristics



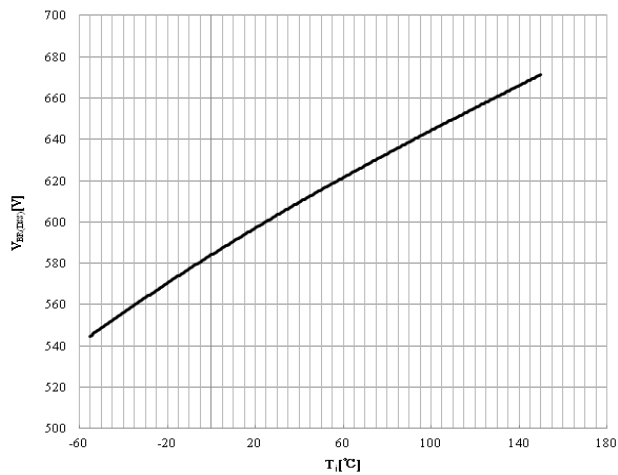
$$I_D = f(V_{GS}); V_{DS} = 20\text{V}$$

Figure 6: Typ. Gate Charge



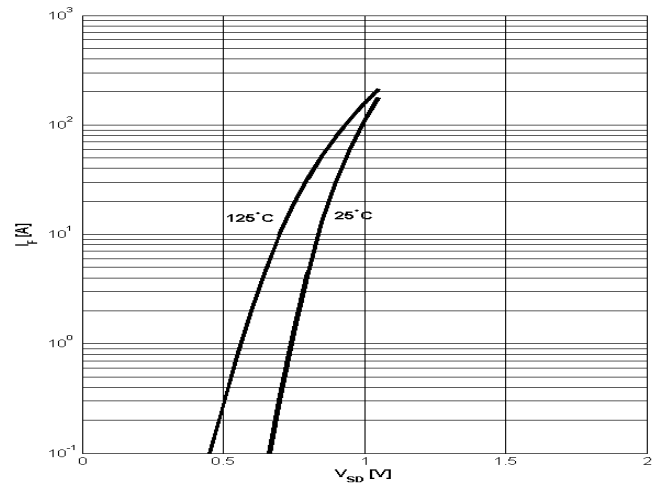
$$V_{GS} = f(Q_{\text{gate}}), I_D = 12\text{A pulsed}$$

Figure 7: Drain-Source Breakdown Voltage



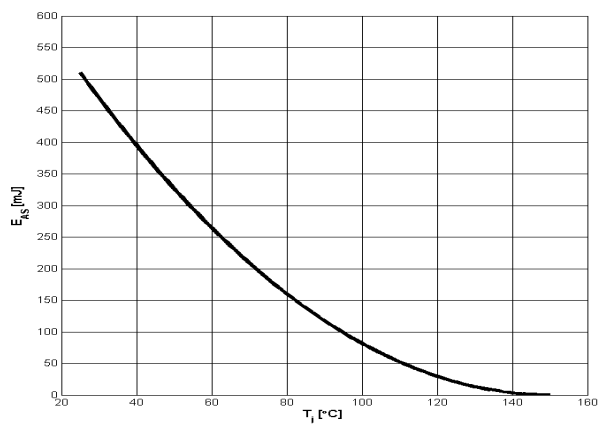
$$V_{BR(DSS)} = f(T_j); I_D = 1\text{mA}$$

Figure 8: Forward Characteristics of Reverse Diode



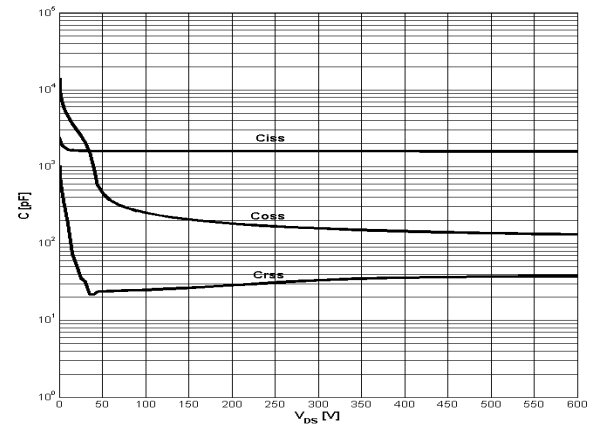
$$I_F = f(V_{SD}); \text{parameter: } T_j$$

Figure 9: Avalanche Energy



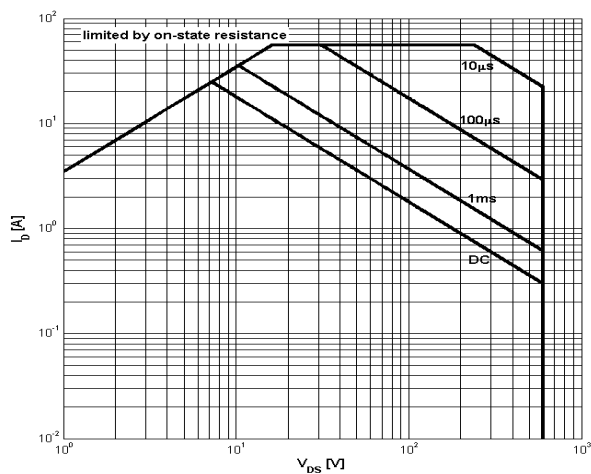
$$E_{AS} = f(T_j); I_D = 3.6\text{A}; V_{DD} = 60\text{V}$$

Figure 10: Typ. Capacitances



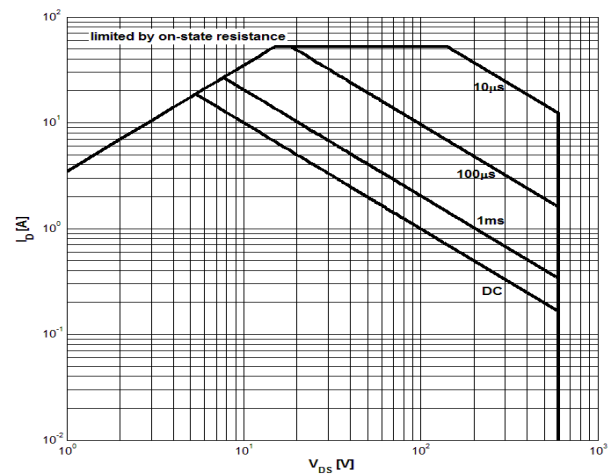
$$C = f(V_{DS}); V_{GS} = 0; f = 1\text{MHz}$$

Figure 11: Safe Operating Area



$$I_D = f(V_{DS}); T_c = 25^\circ\text{C}; V_{GS} > 7\text{V}; \text{parameter } t_p$$

Figure 12: Safe Operating Area



$$I_D = f(V_{DS}); T_c = 80^\circ\text{C}; V_{GS} > 7\text{V}; \text{parameter } t_p$$

Test ircuits and Waveforms

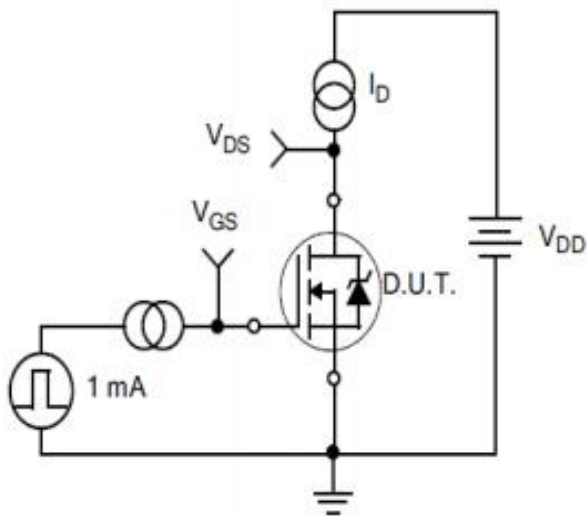


Figure A.
Gate Charge Test Circuit

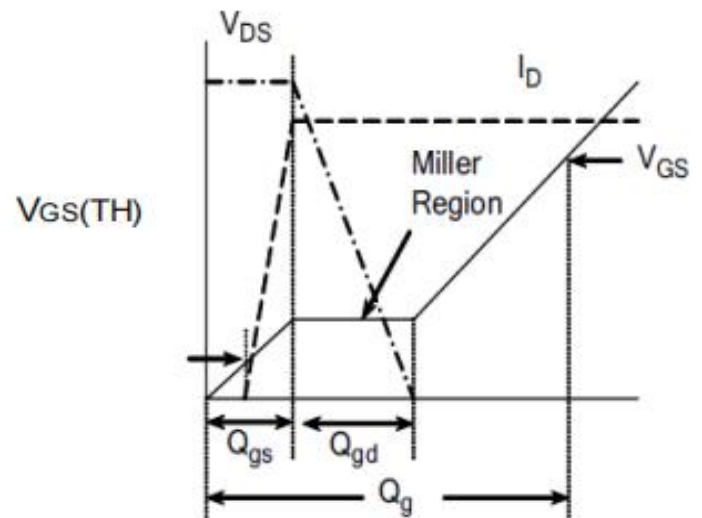


Figure B.
Gate Charge Waveform

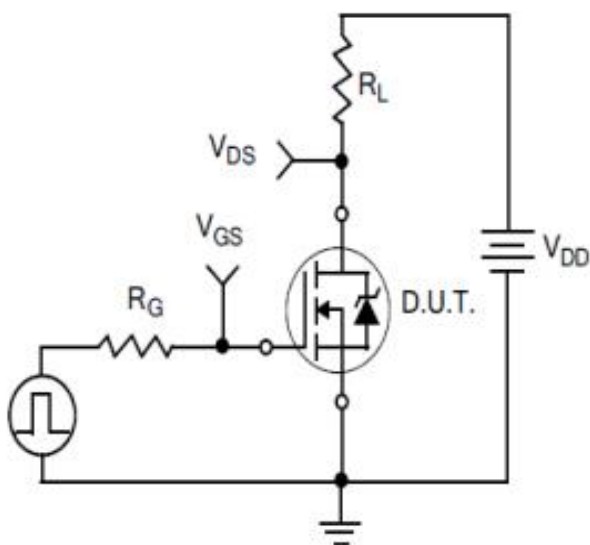


Figure C.
Resistive Switching Test Circuit

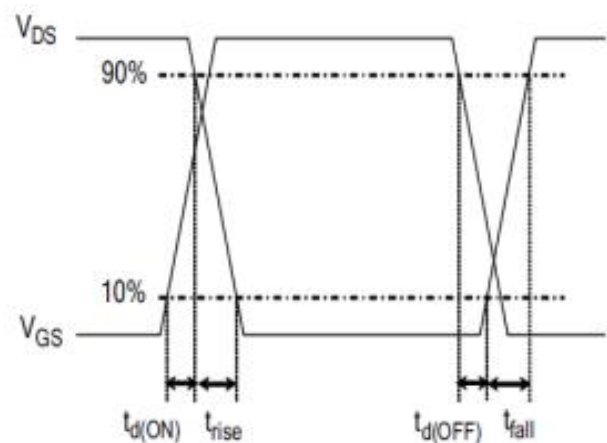
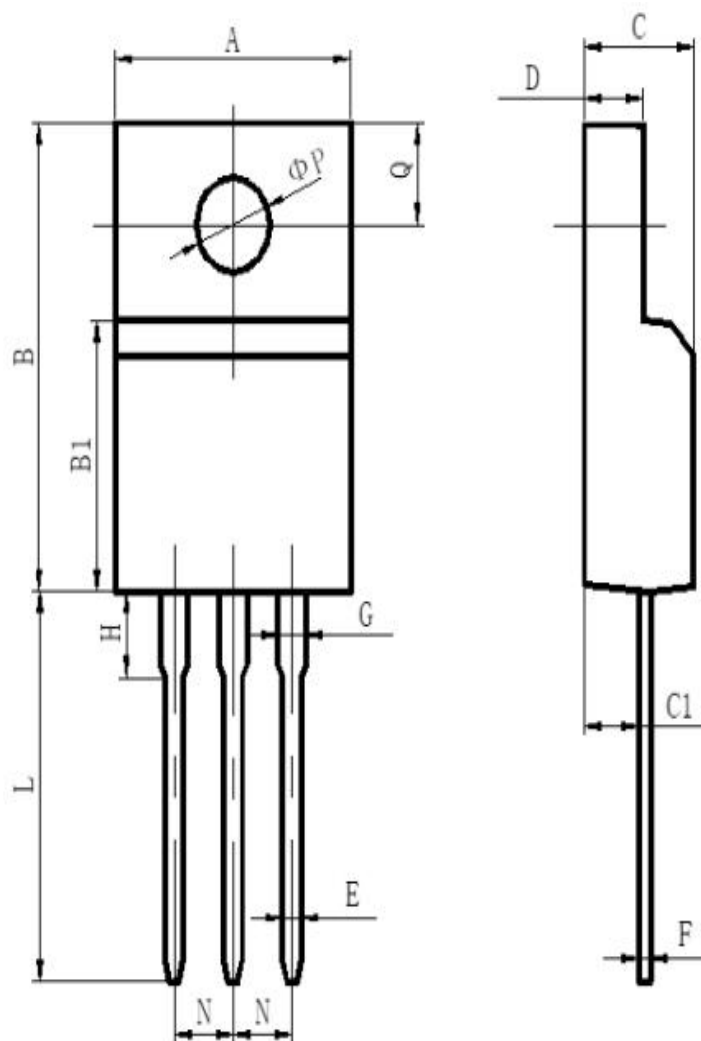


Figure D.
Resistive Switching Waveforms

Package outline drawing TO-220F Unit: mm)



Symbol	unit(mm)	
	MIN	MAX
A	9.7	10.4
B	15.5	16.10
B1	8.95	9.40
C	4.40	4.80
C1	2.15	2.55
D	2.50	2.90
E	0.70	0.90
F	0.40	0.60
G	1.12	1.42
H	3.40	4.00
L	12.6	13.6
N	2.34	2.74
Q	3.15	3.55
ΦP	3.00	3.30