

Silicon N-Channel Super Junction Power MOSFET

Description

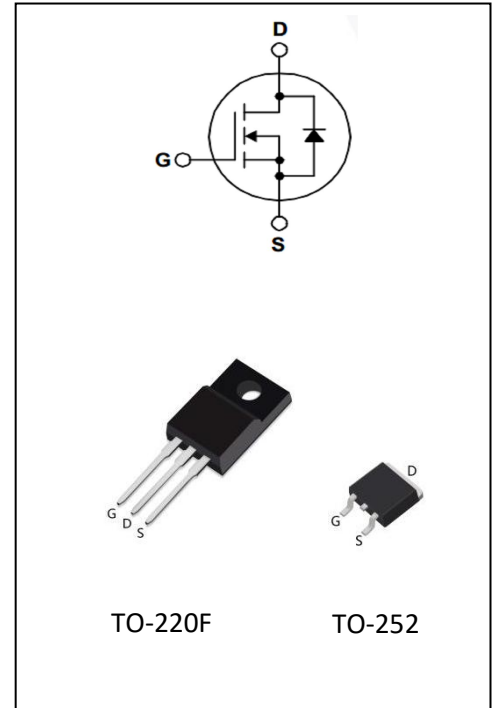
The TH60R550F TH60R550G utilizes the latest Super Junction processing techniques to achieve low on-resistance per silicon area. Additional features of this MOSFET are 150°C operating junction temperature and high repetitive peak current capability. These features combine to make this MOSFET a highly efficient, robust and reliable device. It can be used in a wide variety of applications.

General Features

- $V_{DS}=600V, I_D=8A$
- Low ON Resistance, $R_{DS(ON).max}=550m\Omega @ V_{GS}=10V, I_D=3.5A$
- Low reverse transfer capacitance
- Low Qg for fast response
- Short fall & rise times for fast switching
- 100% single pulse avalanche energy Test

Application

- Power switching application
- Digital amplifier
- Adapter and charger



TO-220F

TO-252

Product Summary

V_{DS}	600V
$R_{DS(on).max}$	550mΩ
I_D	8A

Absolute Maximum Ratings

Parameter	Symbol	TH60R550F	TH60R550G	Unit
Drain-source voltage	V_{DS}	600		V
Continuous drain current $T_C = 25^\circ C$ (Silicon limit)	I_D	8		A
Pulsed drain current ($T_C = 25^\circ C$, t_p limited by T_{jmax})	I_{DM}	24		A
Avalanche energy, single pulse ($L=10mH$, $R_g=25\Omega$)	E_{AS}	400		mJ
Gate-Source voltage	V_{GS}	± 30		V
Power dissipation ($T_C = 25^\circ C$)	P_D	28	63	W
Operating junction and storage temperature	T_j, T_{stg}	-55...+150		$^\circ C$

Thermal Resistance

Parameter	Symbol	TH60R550F	TH60R550G	Unit
Thermal resistance, junction – case.	R_{thJC}	4.5	2	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	80	62	

Electrical Characteristic (at $T_j = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

Static Characteristic

Drain-source breakdown voltage	BV_{DSS}	600	-	-	V	$V_{GS}=0V, I_D=10mA$
Gate threshold voltage	$V_{GS(th)}$	2.8	-	4.2	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	-	100	nA	$V_{DS}=600V, V_{GS}=0V$ $T_j=25^{\circ}\text{C}$
Gate-source leakage current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 30V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	0.48	0.55	Ω	$V_{GS}=10V, I_D=3.5A$

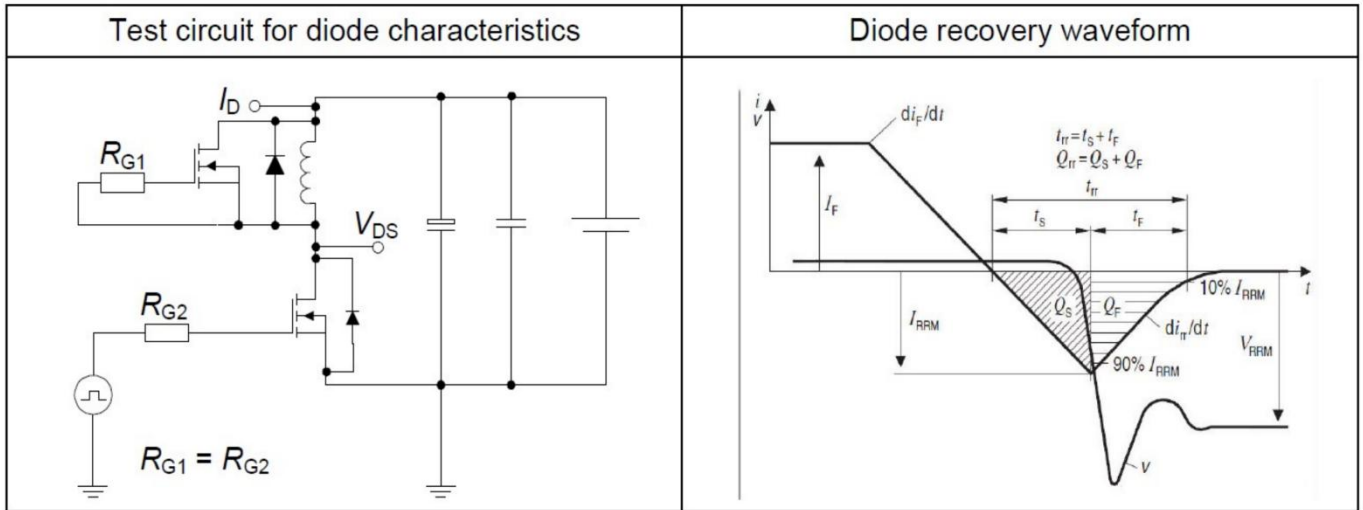
Dynamic Characteristic

Input Capacitance	C_{iss}	-	599	-	pF	$V_{GS}=0V, V_{DS}=50V,$ $f=10kHz$
Output Capacitance	C_{oss}	-	76	-		
Reverse Transfer Capacitance	C_{rss}	-	3.55	-		
Gate Total Charge	Q_g	-	8.0	-	nC	$V_{DD}=400V, I_D=3A$ $V_{GS}=0 \text{ to } 10V$
Gate-Source charge	Q_{gs}	-	2.6	-		
Gate-Drain charge	Q_{gd}	-	1.7	-		
Turn-on delay time	$t_{d(on)}$	-	26.8	-	ns	$V_{DD}=400V, V_{GS}=13V,$ $I_D=3A, R_G=6.8\Omega$
Rise time	t_r	-	24.8	-		
Turn-off delay time	$t_{d(off)}$	-	127.6	-		
Fall time	t_f	-	21.2	-		
Gate resistance	R_G	-	25	-	Ω	$f=1MHz, \text{open drain}$

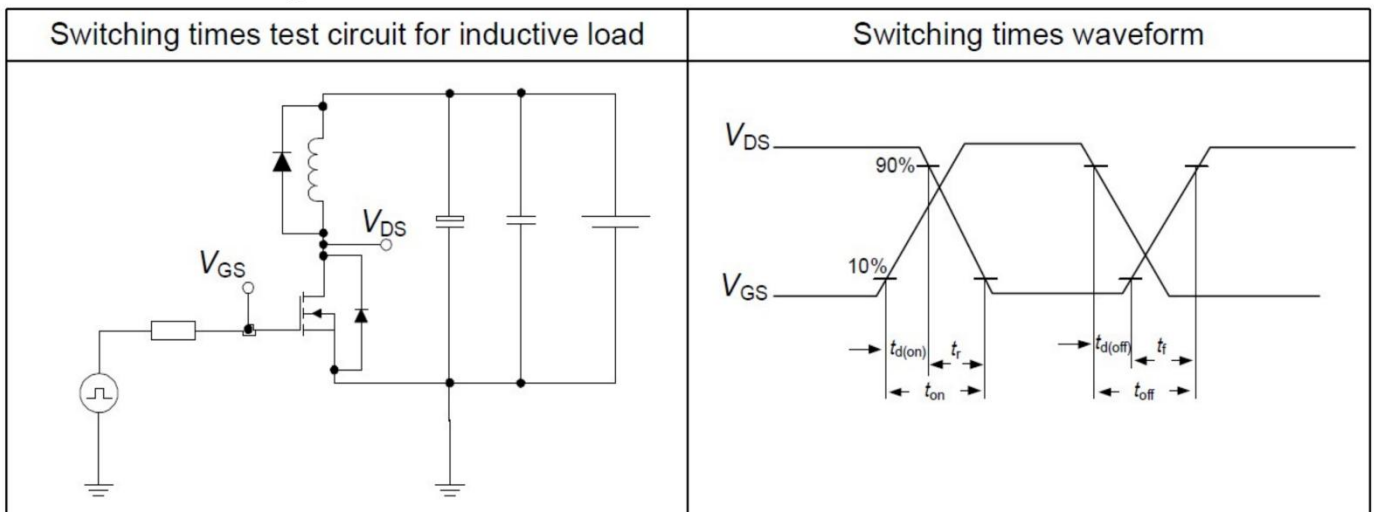
Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.76	-	V	$V_{GS}=0V, I_F=1A$
Body Diode Reverse Recovery Time	t_{rr}	-	170	-	ns	$V_R=400V, I_F=3A,$ $dI/dt=100A/us$
Body Diode Reverse Recovery Charge	Q_{rr}	-	1.2	-	μC	
Peak reverse recovery current	I_{rrm}	-	13.5		A	

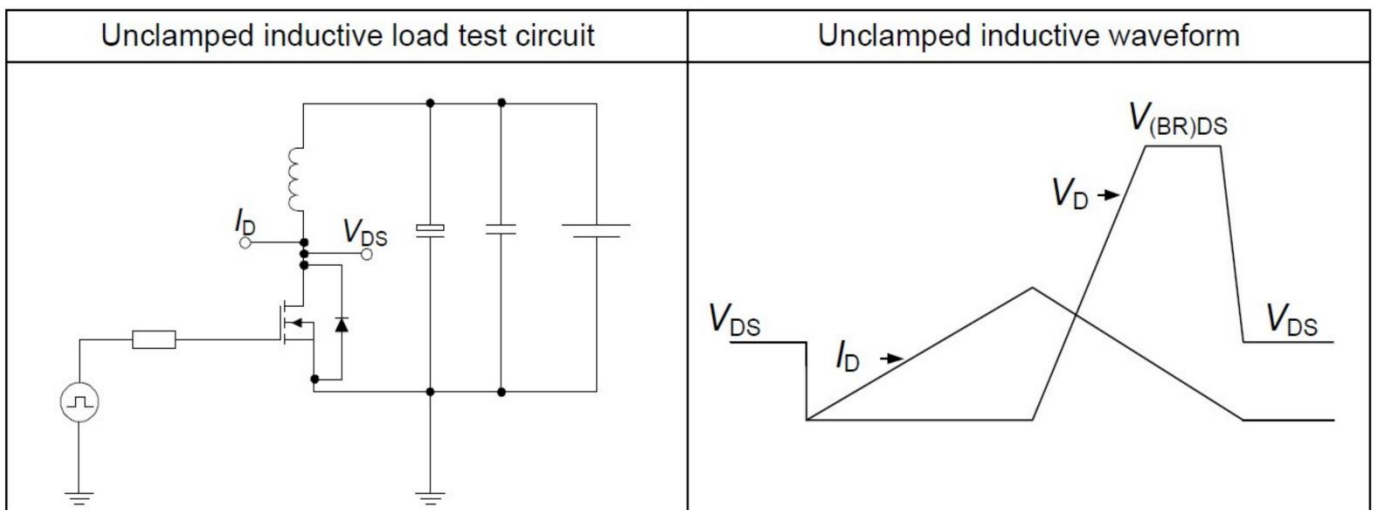
Diode characteristics



Switching times



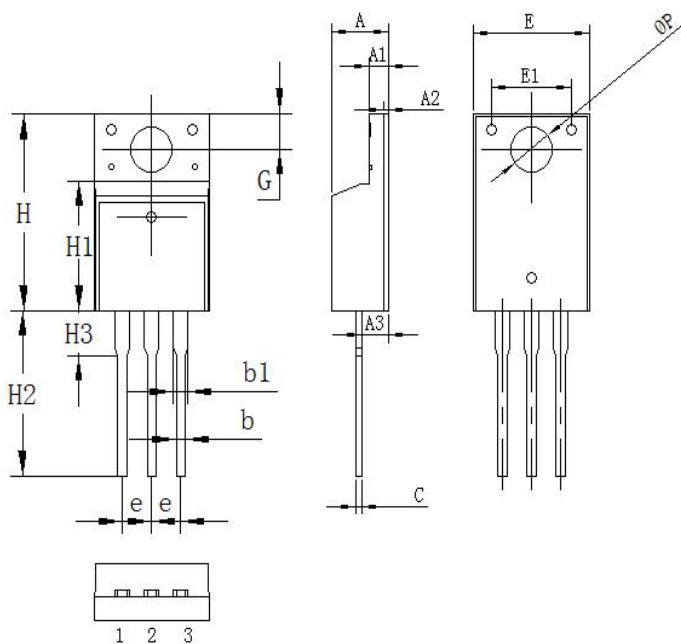
Unclamped inductive load



Package Information

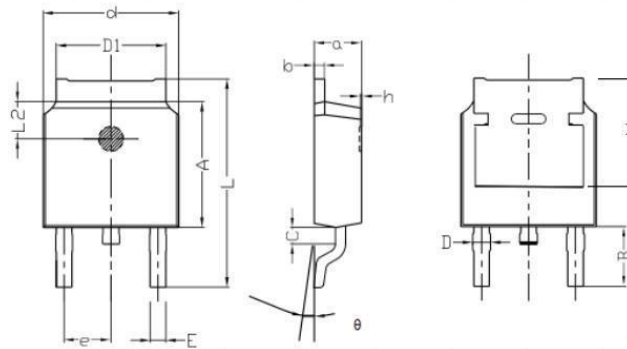
TO-220F PACKAGE

基本尺寸



Symbol	单位 mm		
	Min	Nom	Max
A	4.55	4.75	4.95
A1	2.40	2.60	2.80
A2	0.40	0.60	0.80
A3	2.10	2.30	2.50
b1	1.10	1.30	1.50
b	0.60	0.80	1.00
c	0.42	0.50	0.58
e	2.34	2.54	2.74
E	9.9	10.1	10.3
E1	6.8	7	7.2
H	15.8	16.0	16.2
H1	9.10	9.30	9.50
H2	12.5	13.0	13.5
H3	3.10	3.30	3.50
G	3.00	3.20	3.40
ΦP	3.00	3.20	3.40

TO-252 PACKAGE



ITEM	SPEC (mm)	
	MIN	MAX
a	2.15	2.50
b	0.41	0.61
c	0.70	0.90
D	0.6	1.14
d	6.35	6.80
D1	5.10	5.53
A	5.40	6.40
e	2.09	2.49
L	9.25	10.41
B	2.40	3.40
L2	1.5	1.8
θ	0	8
h	0	0.15
V	5.30REF	
E	0.50	0.90

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