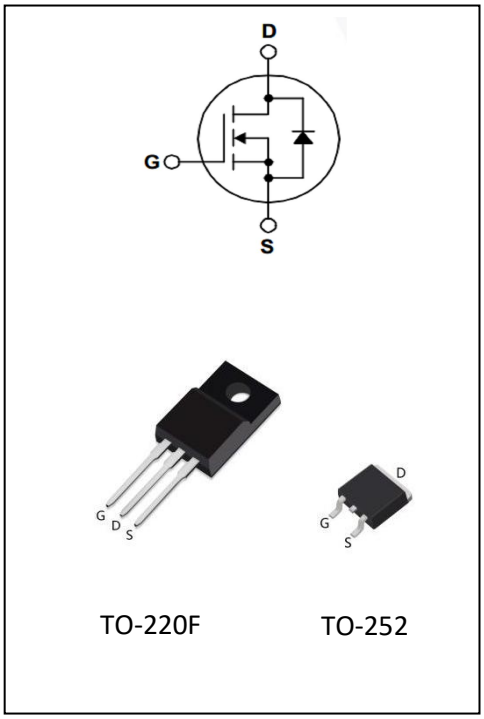
Silicon N-Channel Super Junction Power MOSFET

Description

The TH60R330F TH60R330G utilizes the latest Super Junction processing techniques to achieve low on-resistance per silicon area. Additional features of this MOSFET are 150℃ 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.



TO-220F TO-252

General Features

- V_{DS}=600V,I_D=11A
- Low ON Resistance,$R_{DS(ON).max}$ =330mΩ@V_{GS}=10V,I_D=5.5A
- 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

Product Summary

V_{DS}	600V
$R_{DS(on).max}$	330mΩ
I_D	11A

Absolute Maximum Ratings

Parameter	Symbol	TH60R330F	TH60R330G	Unit
Drain-source voltage	V_{DS}	600		V
Continuous drain current T_C = 25°C (Silicon limit)	I_D	11		A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	I_{DM}	33		A
Avalanche energy, single pulse (L=10mH, Rg=25Ω)	E_{AS}	400		mJ
Gate-Source voltage	V_{GS}	±30		V
Power dissipation (T_C = 25°C)	P_D	32	83	W
Operating junction and storage temperature	T_j, T_{stg}	-55...+150		°C

Thermal Resistance

Parameter	Symbol	TH60R330F	TH60R330G	Unit
Thermal resistance, junction – case.	R_{thJC}	3.9	1.5	℃/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	80	62	

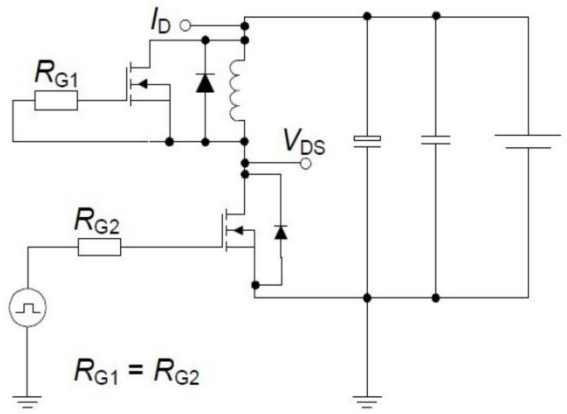
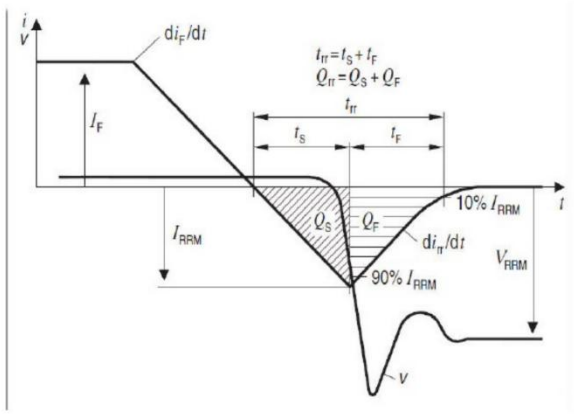
Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

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=250uA
Zero gate voltage drain current	I_{DSS}	-	-	100	nA	V_{DS}=600V, V_{GS}=0V T_j=25℃
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±30V, V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	0.305	0.33	Ω	V_{GS}=10V, I_D=5.5A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	901	-	pF	V_{GS}=0V, V_{DS}=50V, f=10kHz
Output Capacitance	C_{oss}	-	59	-		
Reverse Transfer Capacitance	C_{rss}	-	5.3	-		
Gate Total Charge	Q_g	-	22	-	nC	V_{DD}=400V, I_D=4.8A V_{GS}=0 to 10V
Gate-Source charge	Q_{gs}	-	5.8	-		
Gate-Drain charge	Q_{gd}	-	17	-		
Turn-on delay time	$t_{d(on)}$	-	7.2	-	ns	V_{DD}=400V, V_{GS}=13V, I_D=4.8A, R_G=3.4Ω
Rise time	t_r	-	20.8	-		
Turn-off delay time	$t_{d(off)}$	-	29.2	-		
Fall time	t_f	-	19.2	-		
Gate resistance	R_G	-	10.8	-	Ω	f=1MHz,open drain

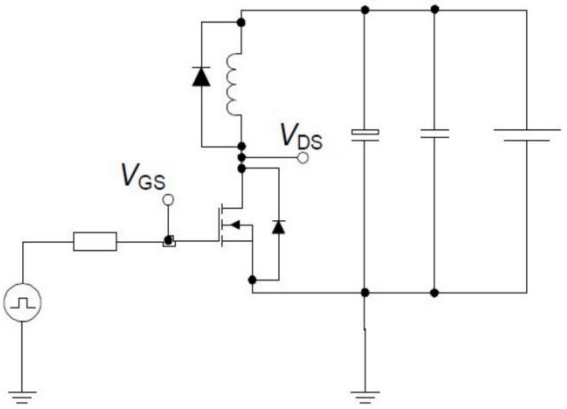
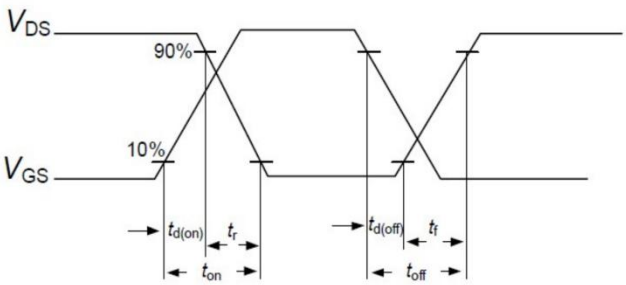
Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.74	-	V	V_{GS}=0V, I_F=1A
Body Diode Reverse Recovery Time	t_{rr}	-	250	-	ns	V_R=400V, I_F=4.8A, dI/dt=100A/us
Body Diode Reverse Recovery Charge	Q_{rr}	-	2.572	-	μC	
Peak reverse recovery current	I_{rrm}	-	19.6		A	

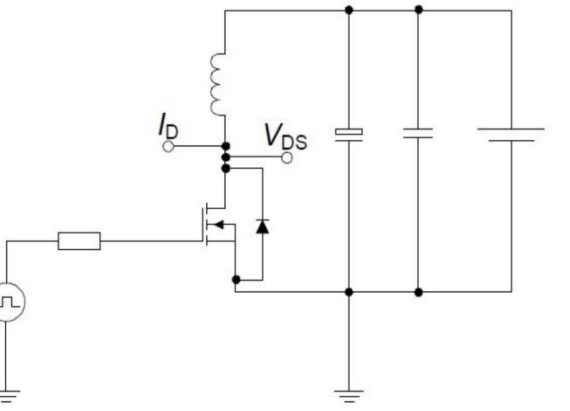
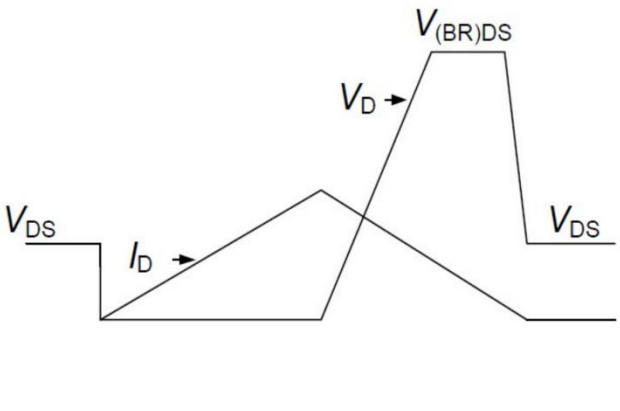
Diode characteristics

Test circuit for diode characteristics	Diode recovery waveform
	

Switching times

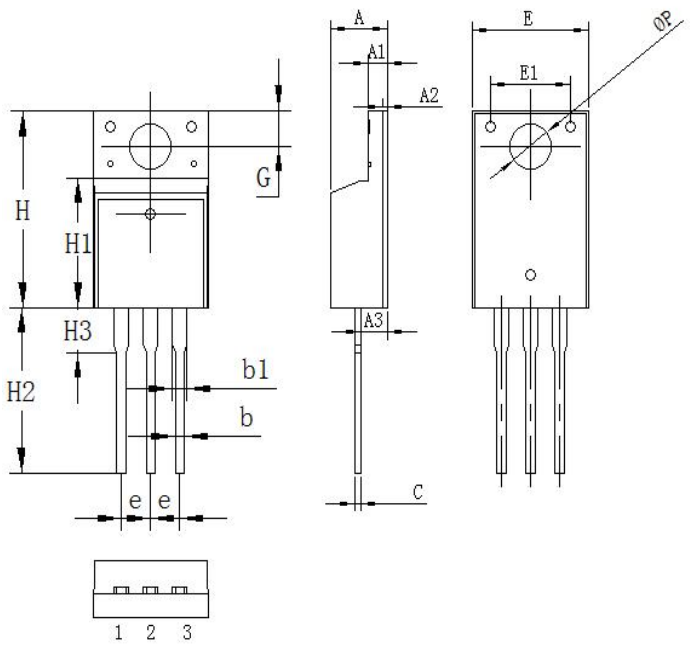
Switching times test circuit for inductive load	Switching times waveform
	

Unclamped inductive load

Unclamped inductive load test circuit	Unclamped inductive waveform
	

Package Information

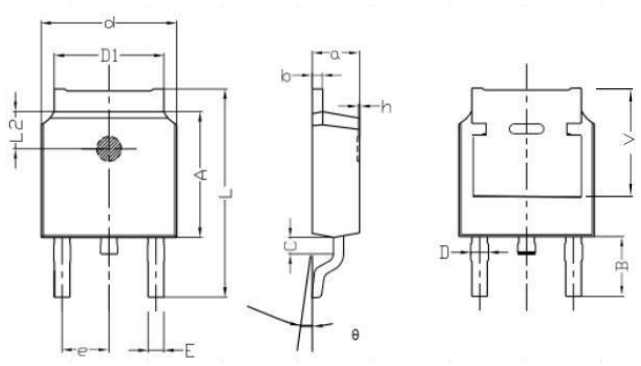
TO-220F PACKAGE



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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