Features

- Super Low Gate Charge
- Green Device Available
- Excellent CdvV/dt effect decline
- Advanced high cell density Trench technology
- 100% EAS Guaranteed

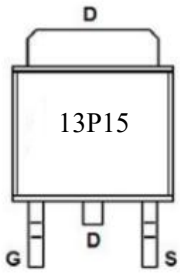
Bvdss	Rdson	ID
-150V	270mΩ	-13A

Application

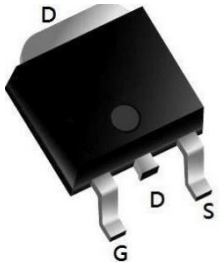
RoHS

- PWM applications
- Load Switch
- Power management

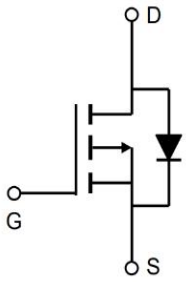
Package



Marking and pin assignment



TO252-3L top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
13P15	13P15	TO252-3L	2500

Absolute Maximum Ratings (T_A=25℃unless otherwise specified noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-150	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current,V_{GS}@-10V[1]	I_D@T_C=25℃	-15	A
	I_D@T_C=100℃	-7.5	A
Pulsed Drain Current[2]	I_{DM}	-60	A
Single Pulse Avalanche Energy[3]	EAS	72.3	mJ
Avalanche Current	I_{AS}	-	A
Total Power Dissipation	P_D@T_C=25℃	50	W
Storage Temperature Range	T_{STG}	-55 ~ 150	℃
Operating Junction Temperature Range	T_J	-55 ~ 150	℃

Thermal Resistance Ratings

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	--	--	℃/W
Thermal Resistance from Junction to Case[1]	$R_{\theta JC}$	--	3	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL13P15	TO252-3L	1	2	3	Tape Reel

Electrical Characteristics (T_J=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250μA	-150	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-150V,V_{GS}=0V,T_J=25℃	-	-	-1	uA
		V_{DS}=-150V,V_{GS}=0V,T_J=85℃	-	-	-100	uA
Gate-body Leakage current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-2	-3	-4	V
Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-2A	-	270	340	mΩ
Gate Resistance	R_g	V_{DS}=0V,V_{GS}=0V,f=1MHz	-	5.2	-	Ω
Input Capacitance	C_{iss}	V_{DS}=-50V,V_{GS}=0V, f=1MHz	-	2069	-	pF
Output Capacitance	C_{oss}		-	44.3	-	
Reverse Transfer Capacitance	C_{rss}		-	37.1	-	
Total Gate Charge	Q_g	V_{GS}=-10V,I_D=-2A, V_{DS}=-50V	-	38.6	-	nC
Gate-Source Charge	Q_{gs}		-	8.1	-	
Gate-Drain Charge	Q_{gd}		-	9.4	-	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-50V,R_G=3Ω, I_D=-2A,V_{GS}=-10V	-	30	-	nS
Rise Time	t_r		-	34	-	
Turn-Off Delay Time	$t_{d(off)}$		-	241	-	
Fall Time	t_f		-	131	-	
Continuous Source Current[1,4]	I_S	V_G=V_D=0V,Force Current	-	-	-13	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V,I_S=-1A,T_J=25℃	-	-	-1.2	V
Reverse Recovery Time	trr	I_F=-2A,di/dt=100A/μs, T_J=25℃	-	34	-	nS
Reverse Recovery Charge	Qrr		-	32.3	-	nC

Notes:

1.The data tested by surface mounted on a1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.

3.The EAS data shows Max. rating . The test condition is V_{DD}=-50V,V_{GS}=-10V,L=1mH.

4.The power dissipation is limited by 150℃ junction temperature.

5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

Figure 1. Output Characteristics

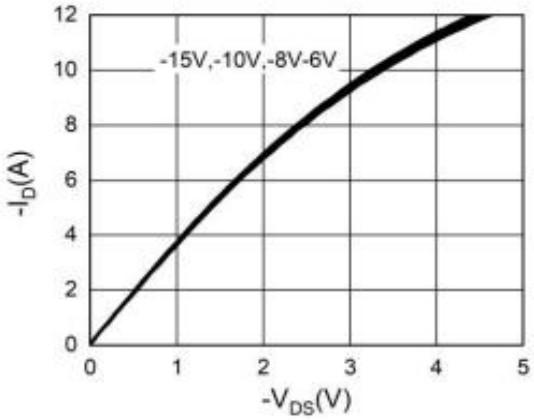


Figure 2. Transfer Characteristics

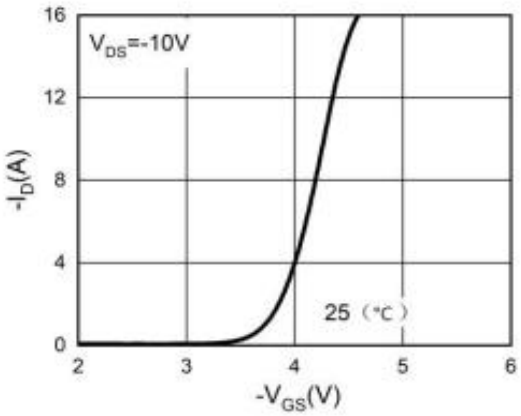


Figure 3. Power Dissipation

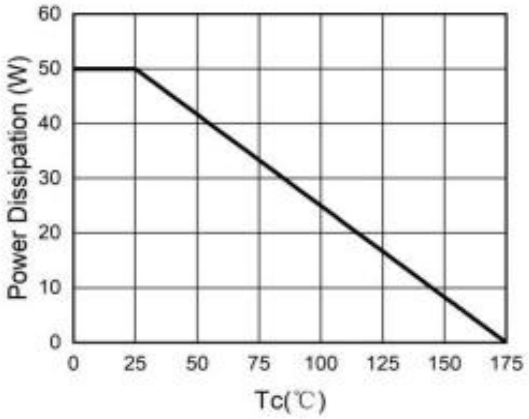


Figure 4. Drain Current

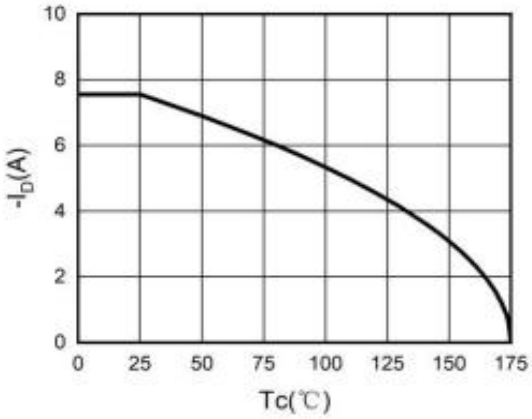


Figure 5. BV_{DSS} vs Junction Temperature

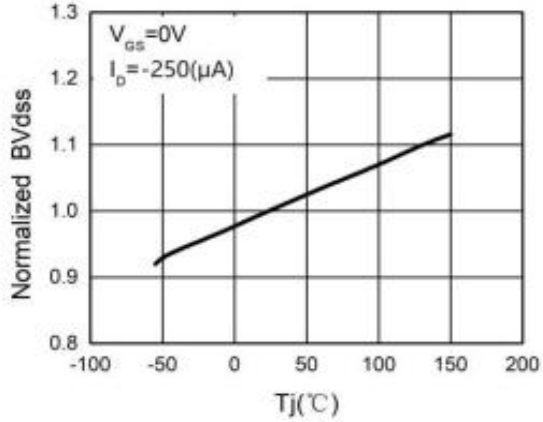


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

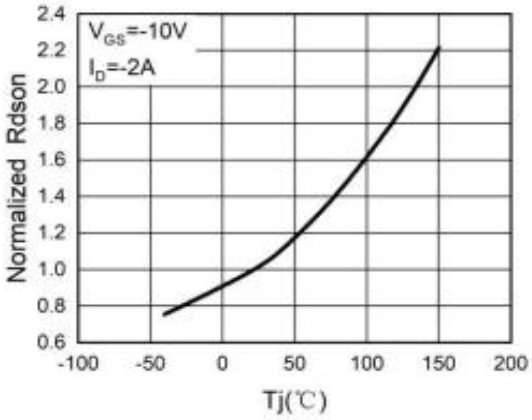


Figure 7. Gate Charge Waveforms

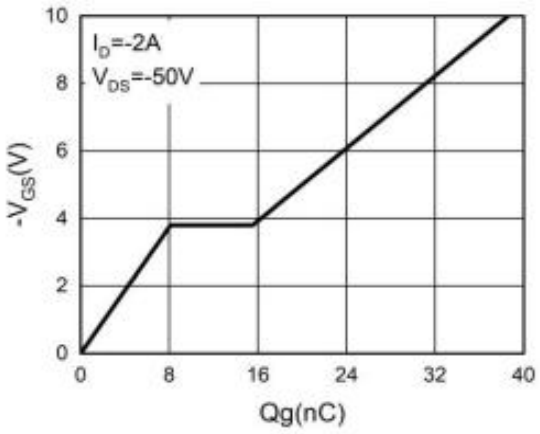


Figure 8. Capacitance

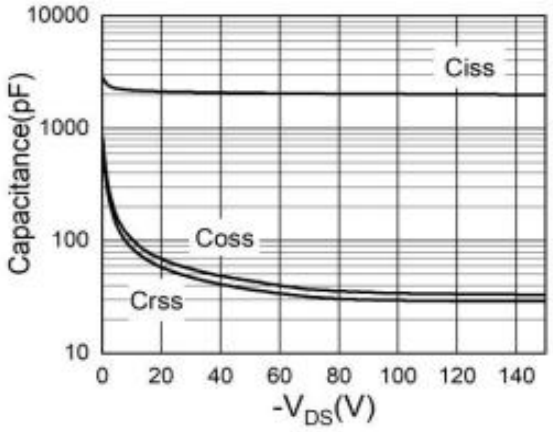


Figure 9. Body-Diode Characteristics

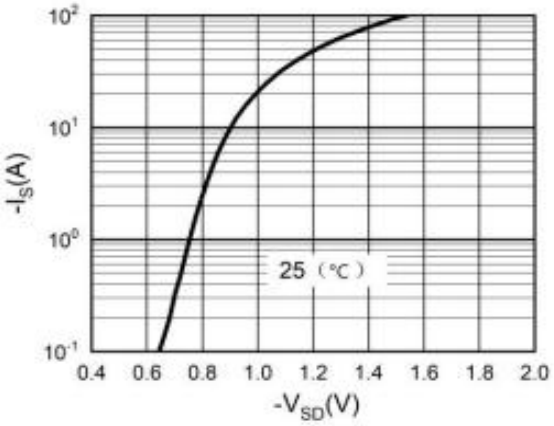
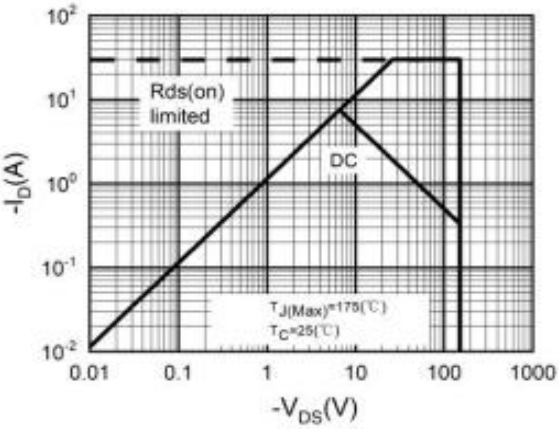
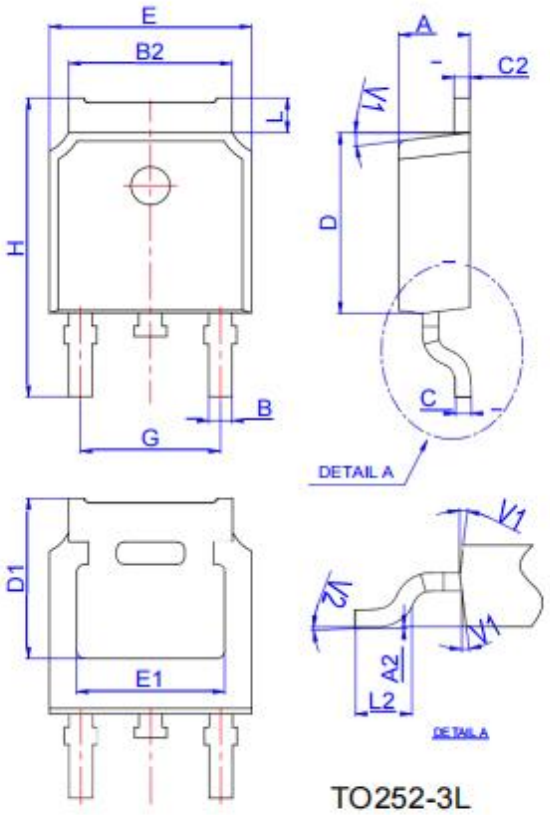


Figure 10. Maximum Safe Operating Area



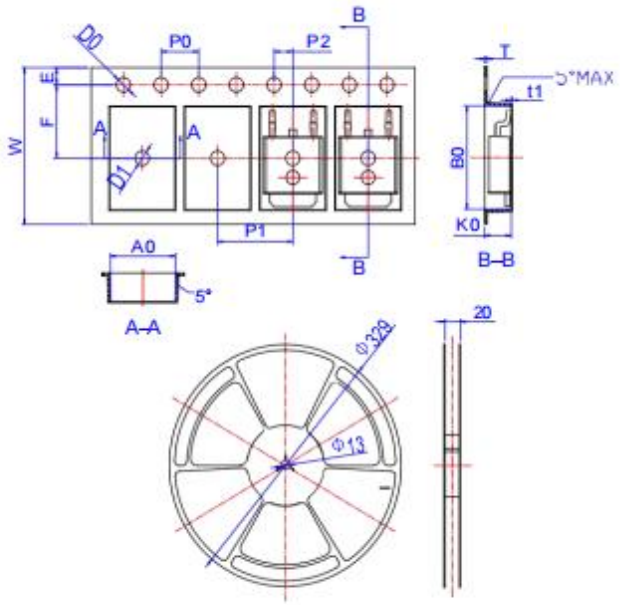
Package Mechanical Data TO252-3L



TO252-3L

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO252-3L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

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