

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	13mΩ@10V	12A
	16mΩ@4.5V	

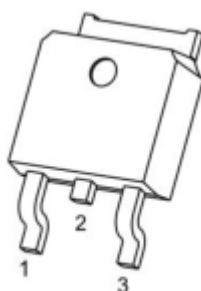
Feature

- $V_{DS} = 30V, I_D = 12A$
 $R_{DS(ON)} < 18m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 23m\Omega @ V_{GS} = 4.5V$
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

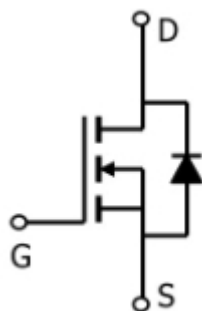
- Power switching application
- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply

Package

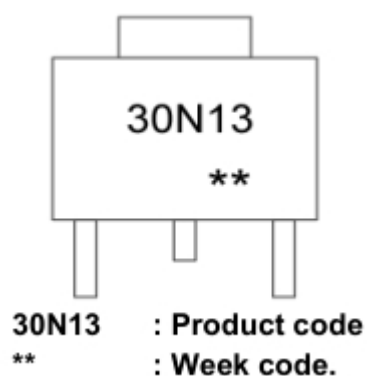


TO-252-2L(G:1 D:2 S:3)

Circuit diagram



Marking



Absolute maximum ratings

($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current $T_C=25^{\circ}\text{C}$	I_D	12	A
Pulsed Drain Current	I_{DM}	36	A
Avalanche Current	I_{AS}	21	A
Avalanche energy ¹	E_{AS}	22.1	mJ
Power Dissipation ²	P_D	25	W
		2	
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	62	$^{\circ}\text{C}/\text{W}$
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	5	$^{\circ}\text{C}/\text{W}$
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^{\circ}\text{C}$

Electrical characteristics

($T_A=25^{\circ}\text{C}$, unless otherwise noted)

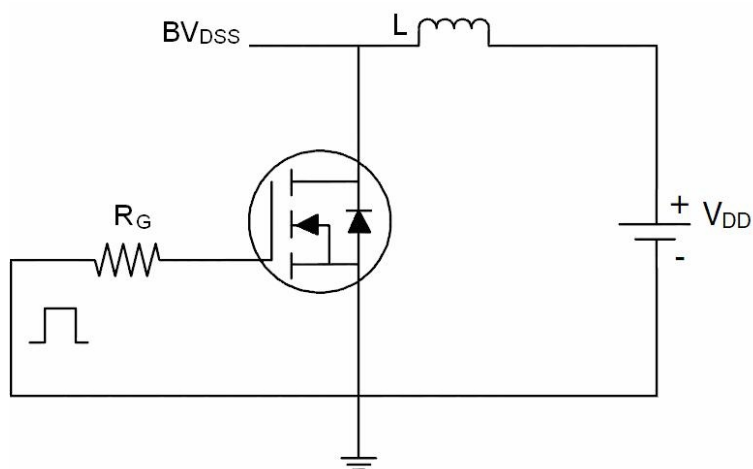
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V _{GS} = 0V, I _D =250mA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} = 0V			1	uA
Gate-Source Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±0.1	uA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250µA	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =10A		13	18	mΩ
		V _{GS} =4.5V, I _D =8A		16	23	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1.0MHz		490		pF
Output Capacitance	C _{Oss}			79		
Reverse Transfer Capacitance	C _{rss}			61		
Total Gate Charge	Q _g	V _{DS} =15V, I _D =5.8A, V _{GS} =10V		5.2		pF
Gate-Source Charge	Q _{gs}			0.9		
Gate-Drain Charge	Q _{gd}			1.3		
Switching Characteristics						
Turn-on Delay Time	T _{d(on)}	V _{DS} =15V, I _D =3A, R _{GEN} =3Ω, V _{GS} =10V		4.5		nS
Turn-on Rise Time	T _r			2.5		
Turn-off Delay Time	T _{d(off)}			14.5		
Turn-off Fall Time	T _f			3.5		
Source-Drain Diode Characteristics						
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} = 0V			1.2	V

Note :

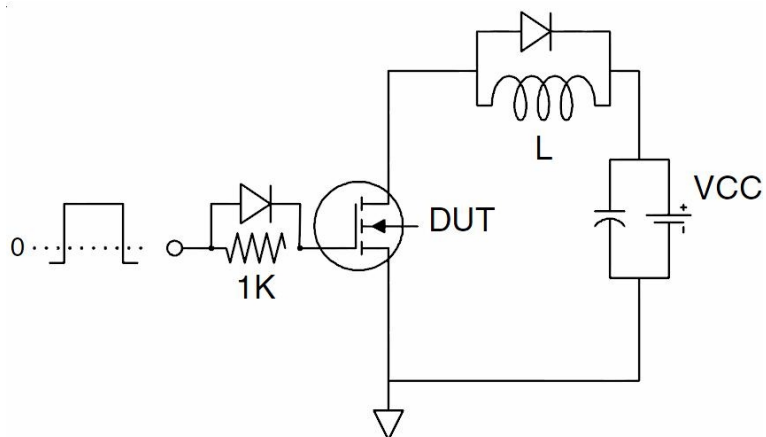
1. $T_j=25^{\circ}\text{C}, V_{DD}=25V, V_G=10V, L=0.1mH, I_{AS} = 21A$

Test Circuit

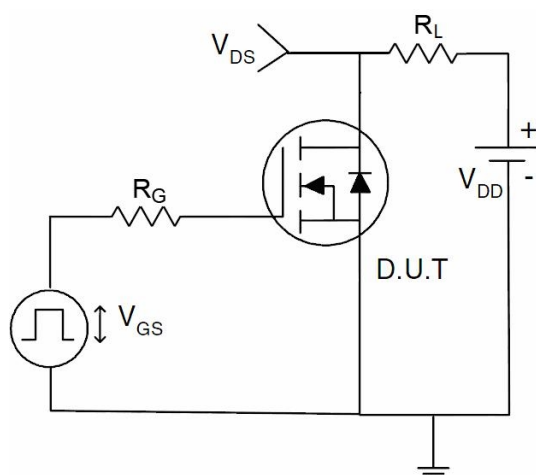
- EAS Test Circuits



- Gate Charge Test Circuit



- Switch Time Test Circuit



Typical Characteristics

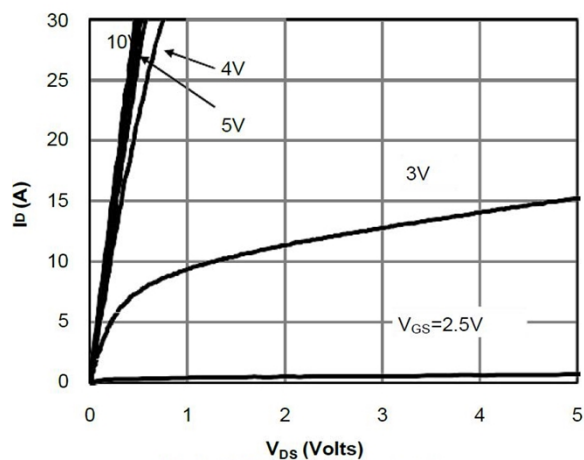


Fig 1: On-Region Characteristics

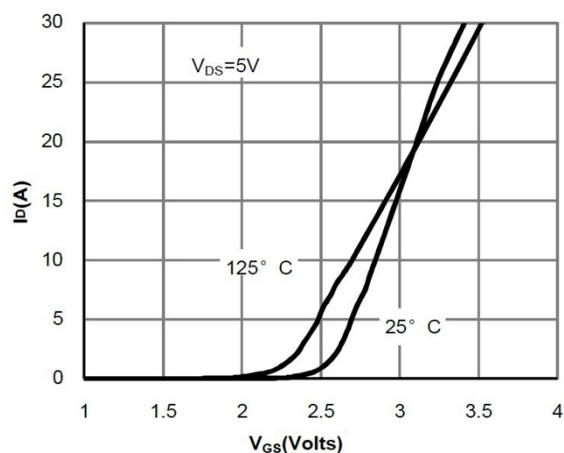


Figure 2: Transfer Characteristics

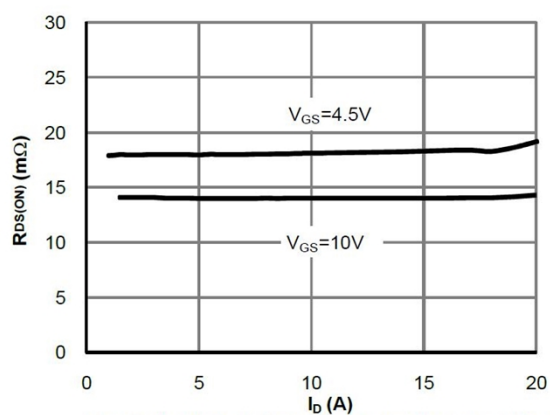


Figure 3: On-Resistance vs. Drain Current and Gate

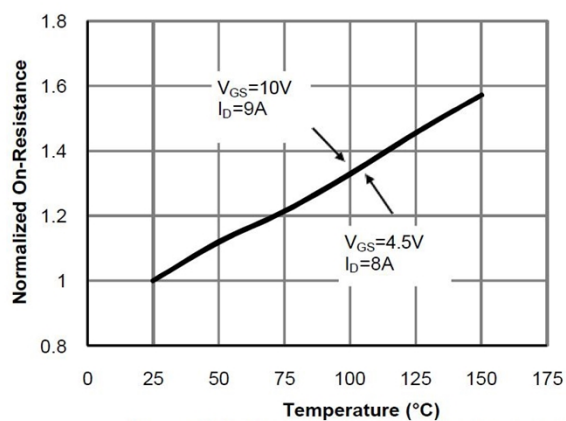


Figure 4: On-Resistance vs. Junction Temperature

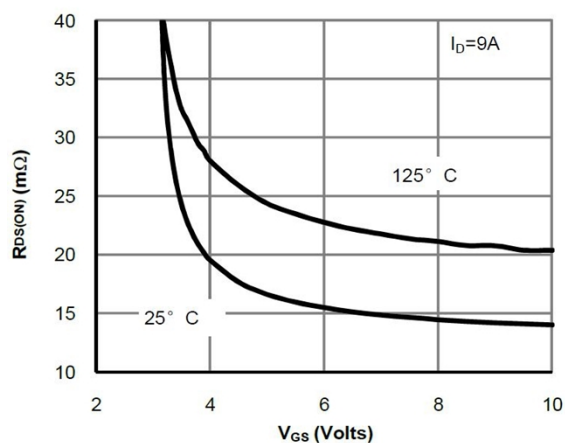


Figure 5: On-Resistance vs. Gate-Source Voltage

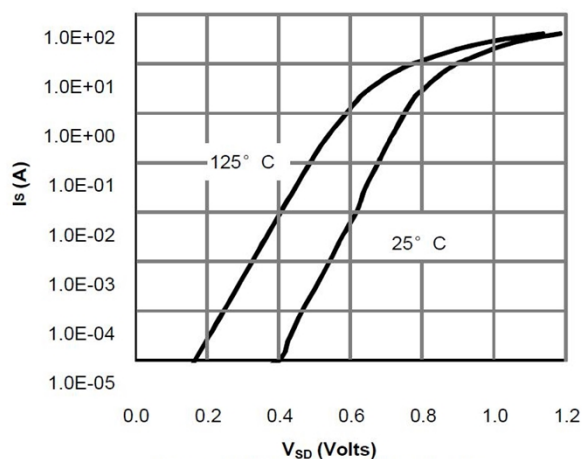


Figure 6: Body-Diode Characteristics

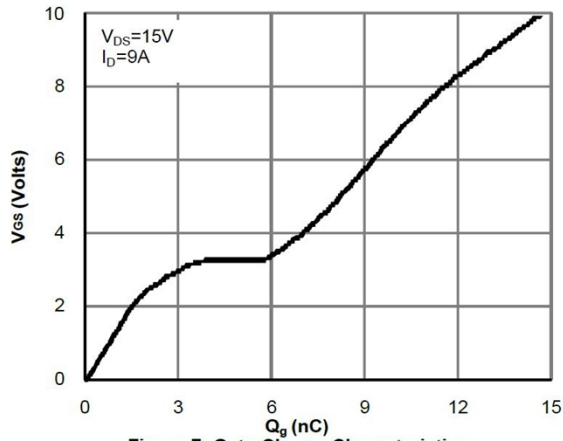


Figure 7: Gate-Charge Characteristics

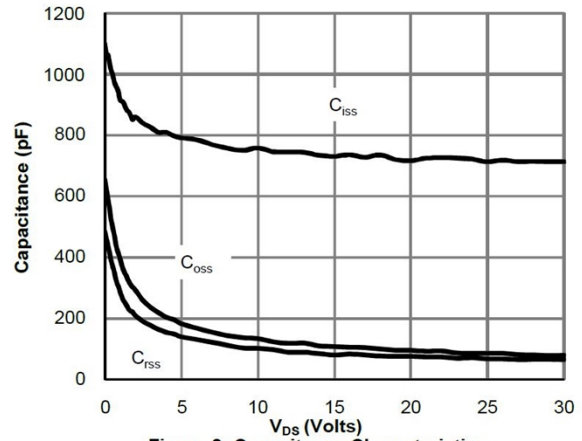


Figure 8: Capacitance Characteristics

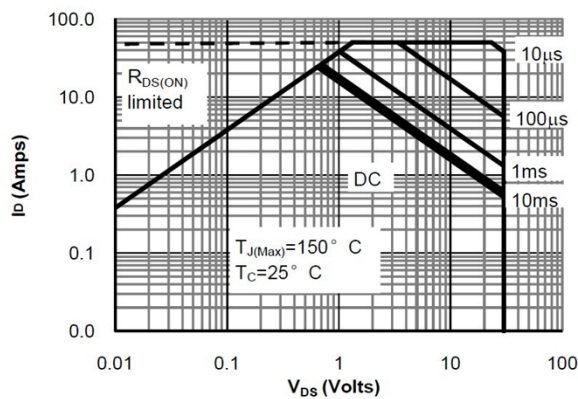


Figure 9: Maximum Forward Biased Safe Operating Area

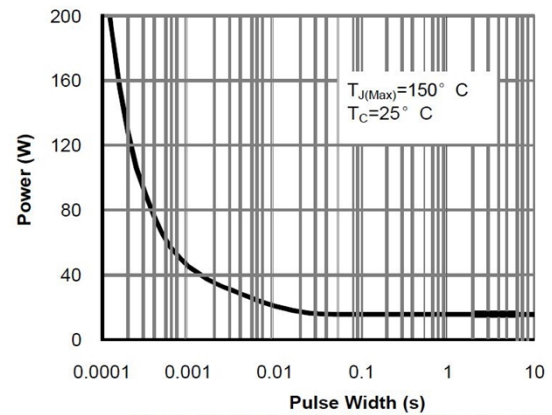


Figure 10: Single Pulse Power Rating Junction-to-Case

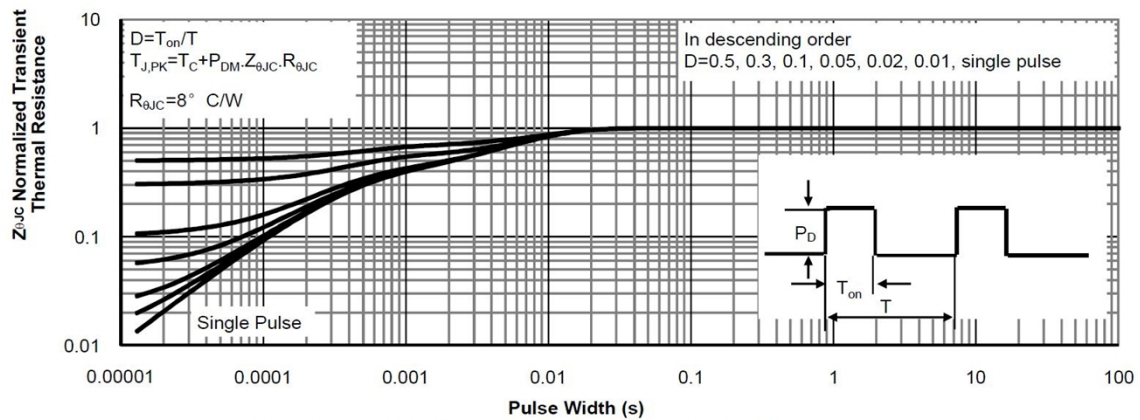
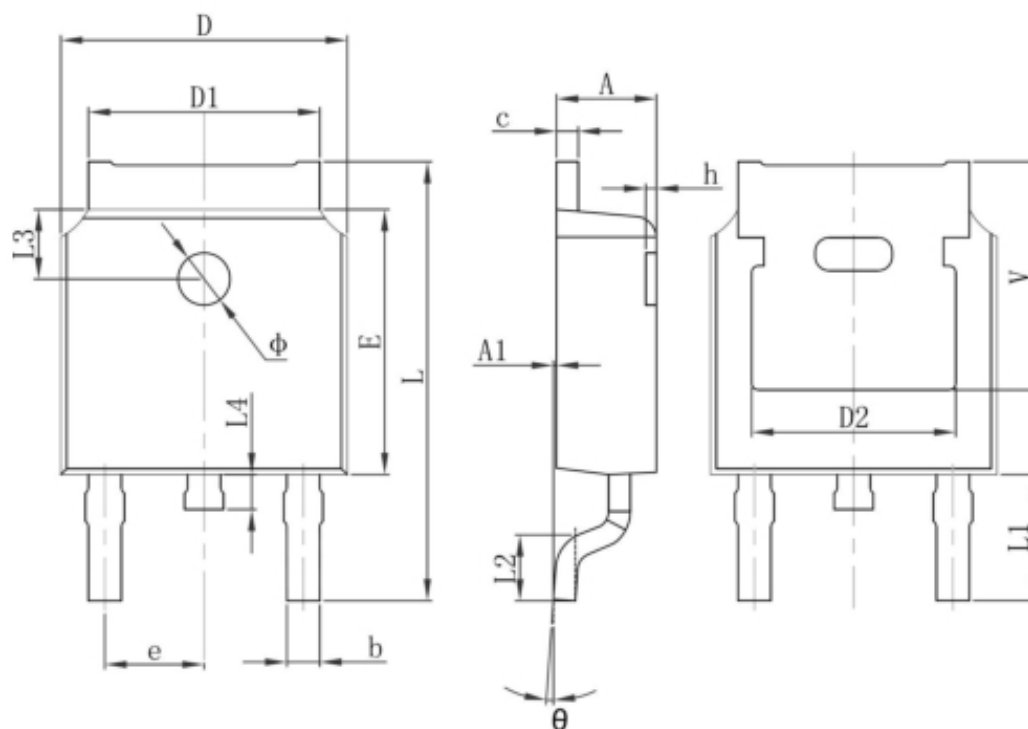


Figure 11: Normalized Maximum Transient Thermal Impedance

TO-252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	