

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-30V	11mΩ@-10V	-45A
	15mΩ@-4.5V	

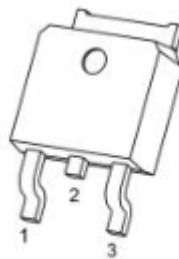
Feature

- $V_{DS} = -38V, I_D = -45A$
- $R_{DS(ON)} < 14m\Omega @ V_{GS} = -10V$
- $R_{DS(ON)} < 20m\Omega @ V_{GS} = -4.5V$
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Packag

Application

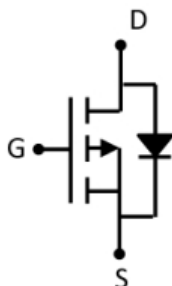
- DC-DC converter
- Load switch
- Power management

Package

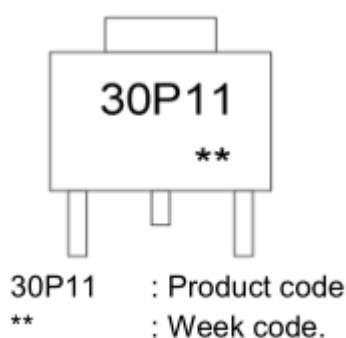


TO-252-2L(G:1 D:2 S:3)

Circuit diagram



Marking



Absolute maximum ratings

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS}=0V$)	V_{DS}	-30	V
Gate-Source Voltage ($V_{DS}=0V$)	V_{GS}	± 25	V
Drain Current-Continuous($T_C=25^{\circ}\text{C}$)	I_D	-45	A
Drain Current-Continuous($T_C=100^{\circ}\text{C}$)		-30	
Drain Current-Continuous@ Current-Pulsed ⁽¹⁾	I_{DM}	-150	A
Maximum Power Dissipation($T_C=25^{\circ}\text{C}$)	P_D	45	W
Maximum Power Dissipation($T_a=25^{\circ}\text{C}$)		2	
Single pulse avalanche energy ⁽²⁾	E_{AS}	125	mJ
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	2.8	$^{\circ}\text{C}/\text{W}$
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	62	$^{\circ}\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~ +150	$^{\circ}\text{C}$

Electrical characteristics

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

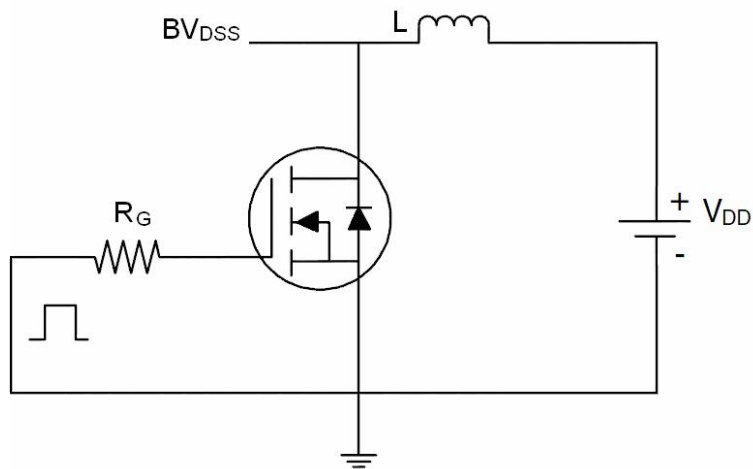
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V _{GS} = 0V, I _D = -250μA	-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30V, V _{GS} = 0V			-1	uA
Gate-Source Leakage	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			±100	uA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D = -250μA	-1	-1.6	-2.5	V
Drain-Source On-Resistance ¹	R _{DS(on)}	V _{GS} = -10V, I _D = -20A		11	14	mΩ
		V _{GS} = -4.5V, I _D = -15A		15	20	
Dynamic Characteristics						
Input Capacitance	C _{iSS}	V _{DS} = -15V, V _{GS} =0V, f=1MHz		2380		pF
Output Capacitance	C _{oSS}			385		
Reverse Transfer Capacitance	C _{rSS}			288		
Total Gate Charge	Q _g	V _{GS} = -10V,V _{DS} = -15V, I _D = -12A		40		nC
Gate-Source Charge	Q _{gs}			7.5		
Gate-Drain Charge	Q _{gd}			10		
Switching Characteristics						
Turn-on Delay Time	T _{d(on)}	V _{DD} = -15V, I _D = -1A , R _L =15Ω, V _{GS} = -10V, R _G =2.5Ω		11		nS
Turn-on Rise Time	T _r			24		
Turn-off Delay Time	T _{d(off)}			38		
Turn-off Fall Time	T _f			10		
Drain-Source Diode Characteristics						
Source-Drain Current					-38	
Forward on voltage	V _{SD}	I _{SD} = -6A,V _{GS} =0V			-1.2	V

Note:

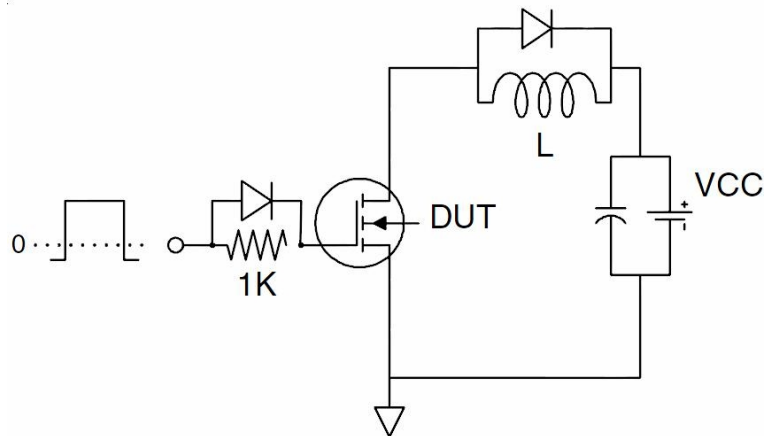
1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. The E_{AS} data shows Max. rating . The test condition is $V_{DD} = -25V, V_{GS} = -10V, L = 0.1mH, I_{AS} = -50A$

Test Circuits

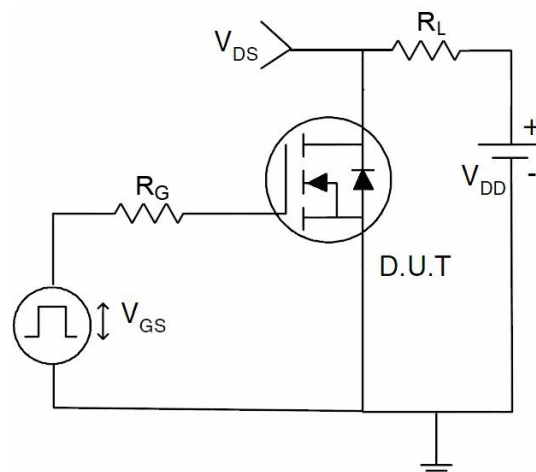
- EAS Test Circuits



- Gate Charge Test Circuit



- Switch Time Test Circuit



Typical Characteristics

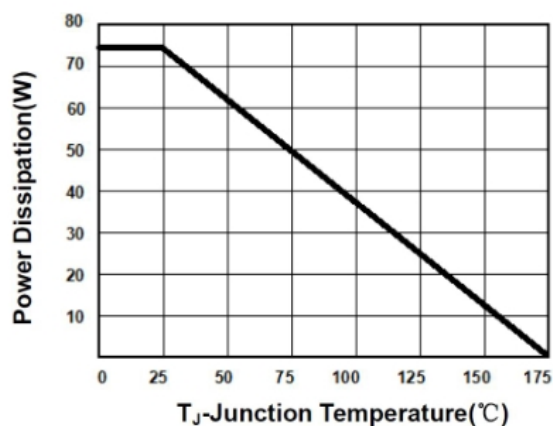


Figure1. Power Dissipation

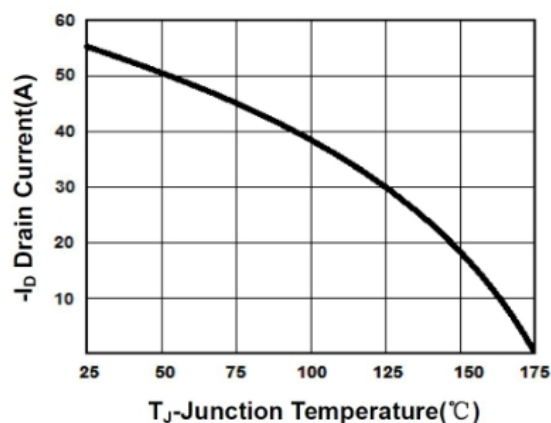


Figure2. Drain Current

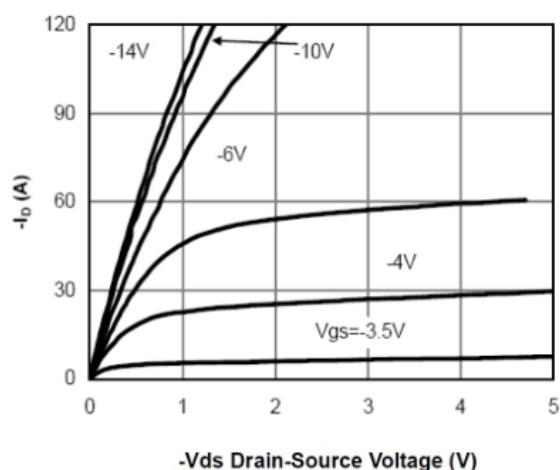


Figure3. Output Characteristics

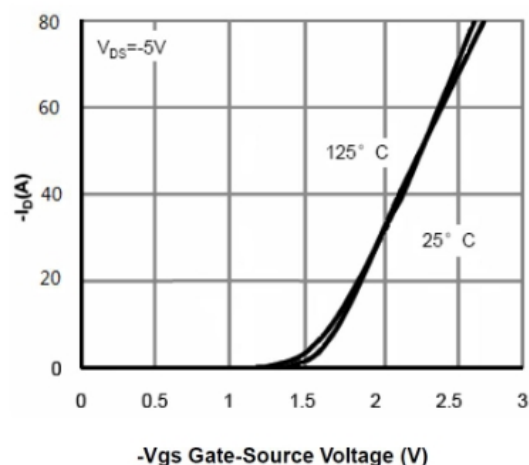


Figure4. Transfer Characteristics

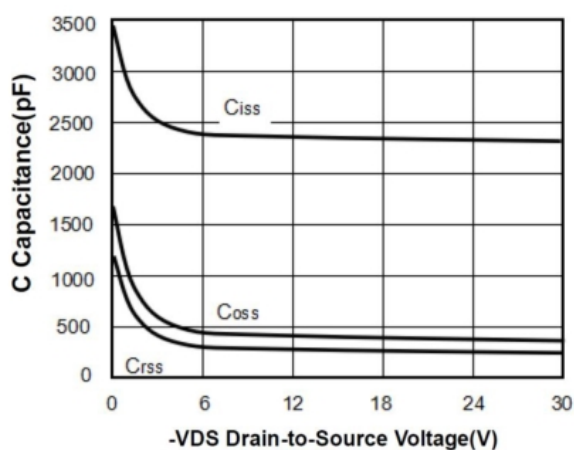


Figure5. Capacitance

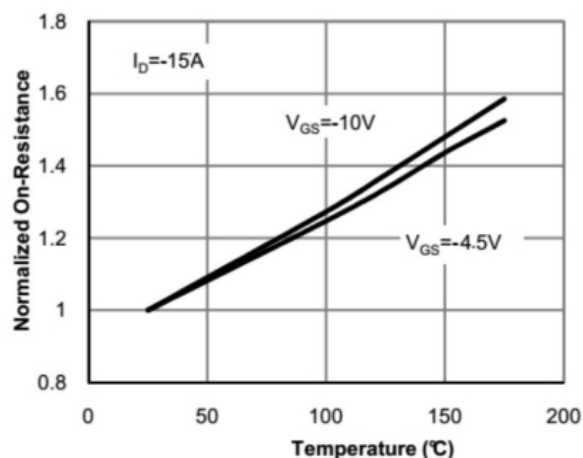


Figure6. RDS(ON) vs Junction Temperature

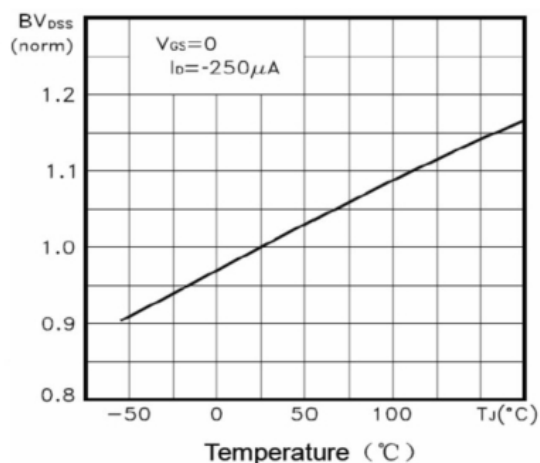


Figure7. Max BVDS vs Junction Temperature

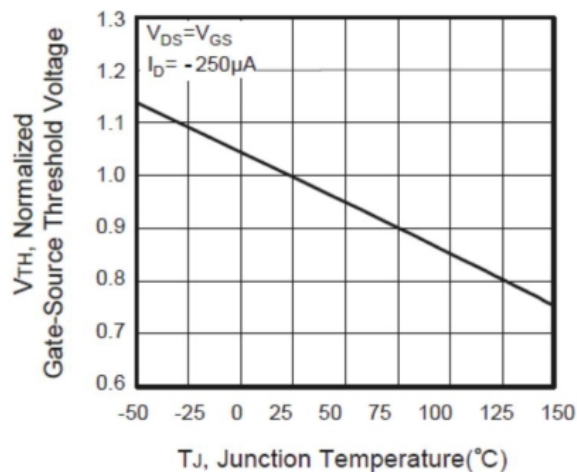


Figure8. VGS(th) vs Junction Temperature

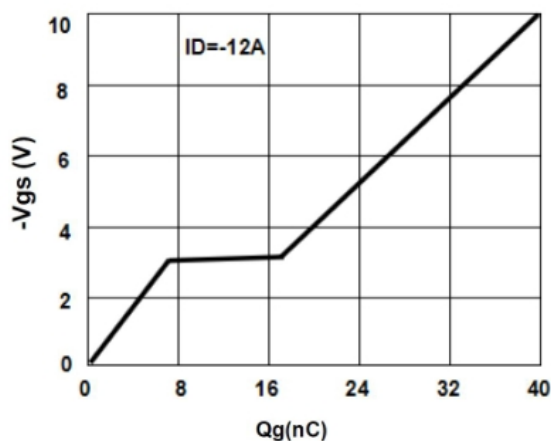


Figure9. Gate Charge Waveforms

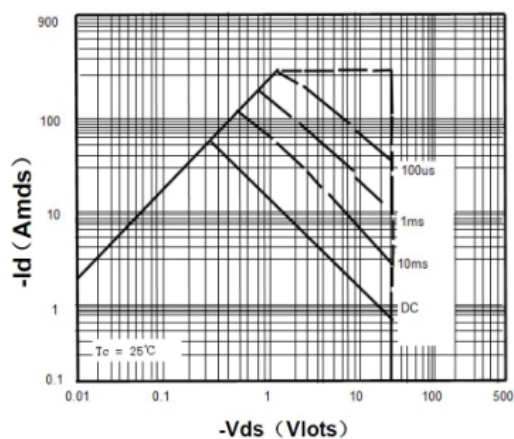


Figure10. Maximum Safe Operating Area

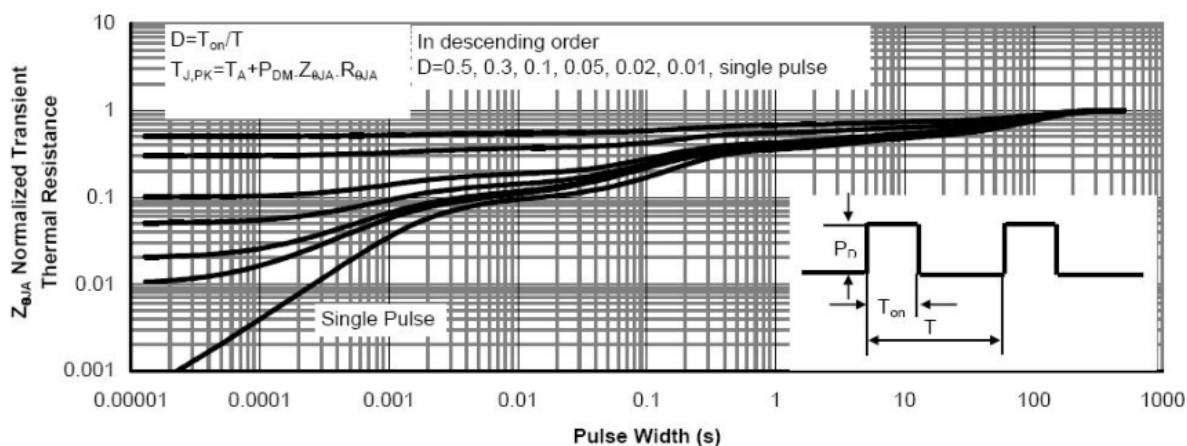
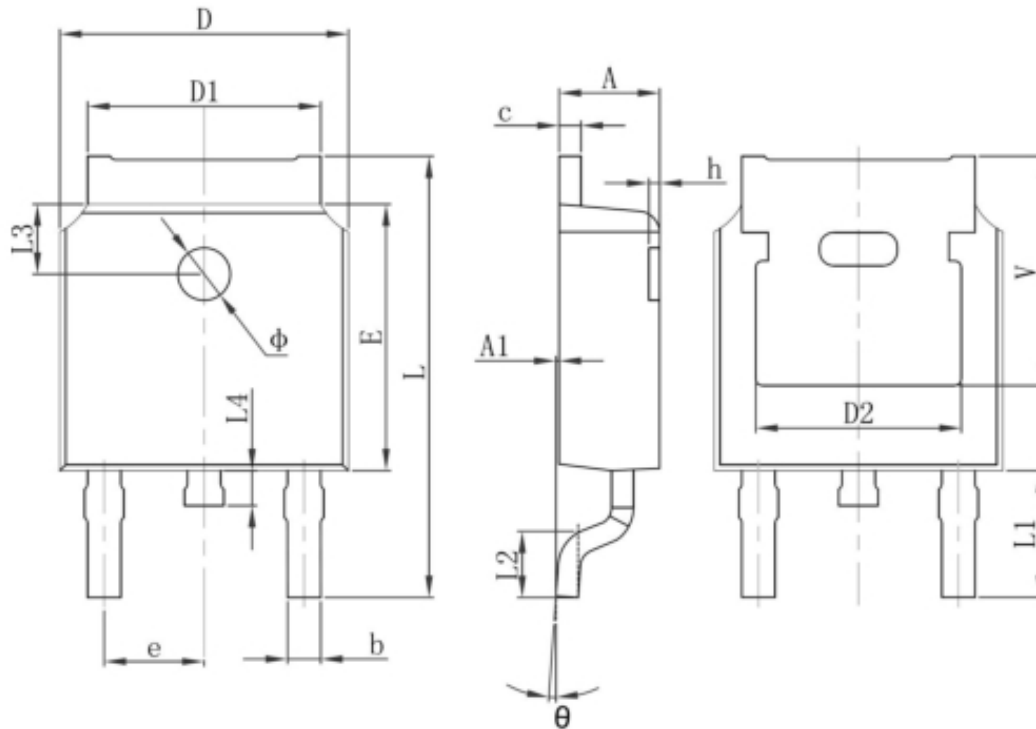


Figure11. Normalized Maximum Transient Thermal Impedance

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.	