

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	7m Ω @10V	40A
	10.5m Ω @4.5V	

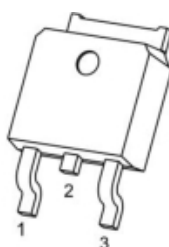
Feature

- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

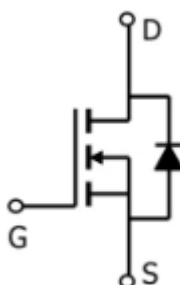
- PWM applications
- Load switch
- Power management

Package

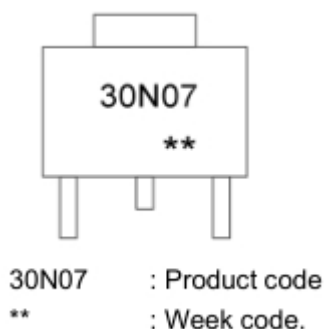


TO-252-2L(G:1 D:2 S:3)

Circuit diagram



Marking



Absolute maximum ratings

(T_a=25°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}	±20	V
Drain Current-Continuous(T _C =25°C) ¹	I _D	40	A
Drain Current-Continuous(T _C =100°C)		28	
Drain Current-Continuous@ Current-Pulsed ²	I _{DM (pluse)}	160	A
Maximum Power Dissipation(T _C =25°C)	P _D	50	W
Maximum Power Dissipation(T _C =100°C)	P _D	25	
Avalanche energy	E _{AS}	90	mJ
Thermal Resistance,Junction-to-Case	R _{θJC}	3	°C/W
Operating Junction and Storage Temperature Range	T _{STG} , T _J	-55~+175	°C

Electrical characteristics

(T_A=25°C, unless otherwise noted)

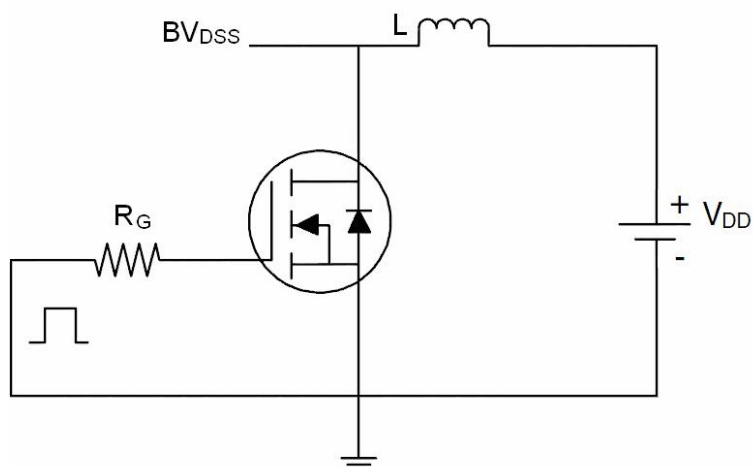
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V _{GS} = 0V, I _D =250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} = 0V			1	uA
Gate-Source Leakage	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			±100	uA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.5	2.5	V
Forward Transconductance	g _{FS}	V _{DS} =5V,I _D =20A	10	20		S
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		7	9	mΩ
		V _{GS} =4.5V, I _D =15A		10.5	15	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz		1050		pF
Output Capacitance	C _{Oss}			145		
Reverse Transfer Capacitance	C _{rss}			120		
Gate resistance	R _g	V _{GS} =0V,V _{DS} =0V,f=1.0MHz		2		Ω
Switching Times						
Turn-on Delay Time	T _{d(on)}	V _{GS} =10V, V _{DS} =15V, R _L =0.75W, R _{GEN} =3W		7		nS
Turn-on Rise Time	T _r			22		
Turn-off Delay Time	T _{d(off)}			30		
Turn-off Fall Time	T _f			5		
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =25V, I _D =12A		22		pF
Gate-Source Charge	Q _{gs}			4		
Gate-Drain Charge	Q _{gd}			7		
Source-Drain Diode Characteristics						
Gate-Drain Charge	V _{SD}	V _{GS} =0V , I _S =20A			1.2	V

Notes:

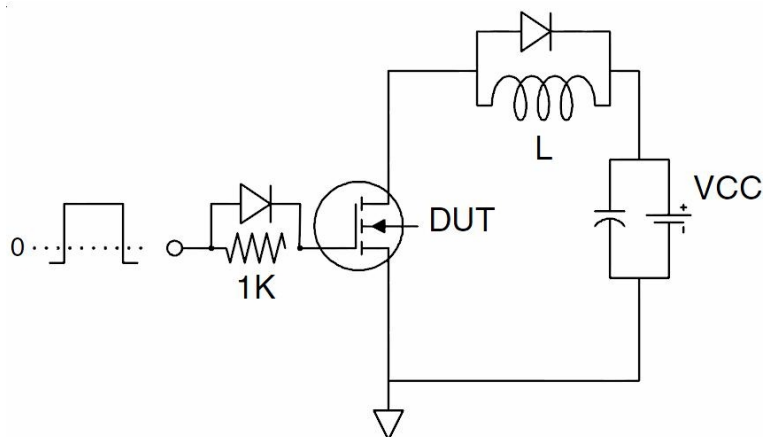
1. The maximum current rating is package limited
2. Repetitive Rating: Pulse width limited by maximum junction
3. E_{AS} condition: T_J = 25°C, V_{DD} = 30V, V_G = 10V, R_G = 25Ω

Test Circuit

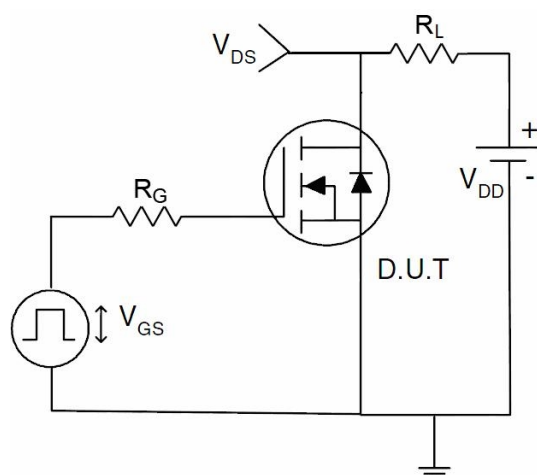
- EAS Test Circuits



- Gate Charge Test Circuit



- Switch Time Test Circuit



Typical Characteristics

Figure 1. Output Characteristics

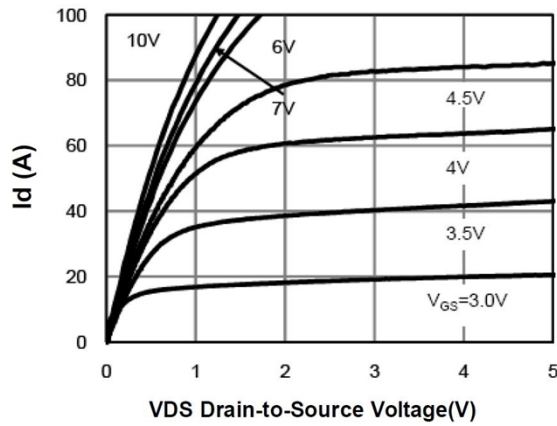


Figure 2. Transfer Characteristics

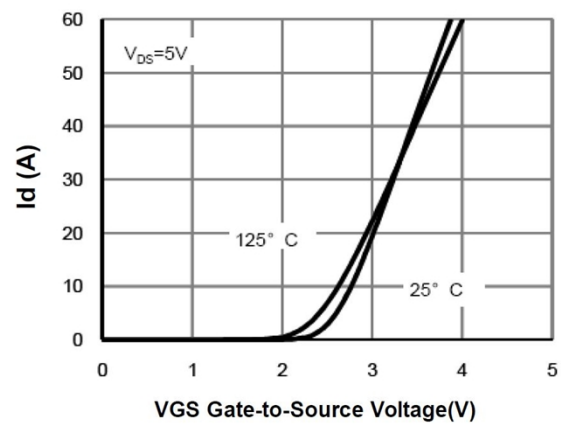


Figure 3. Max BV_{DSS} vs Junction Temperature

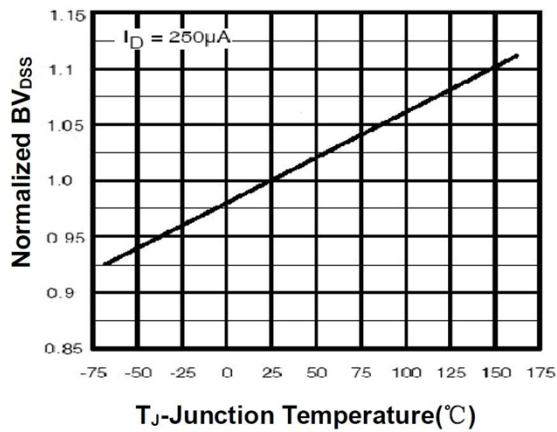


Figure 4. Drain Current

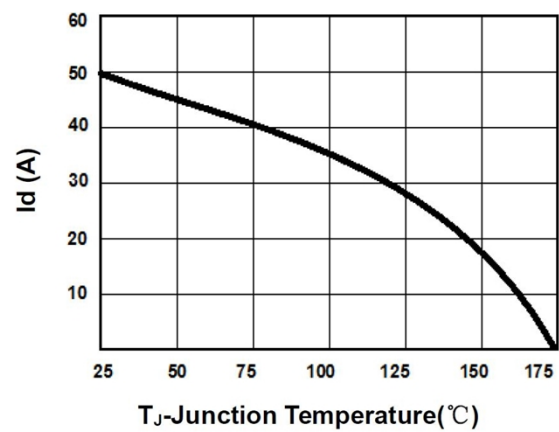


Figure 5. $V_{GS(th)}$ vs Junction Temperature

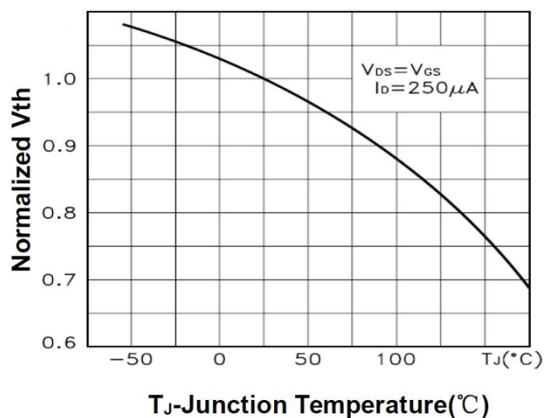


Figure 6. $R_{DS(on)}$ vs Junction Temperature

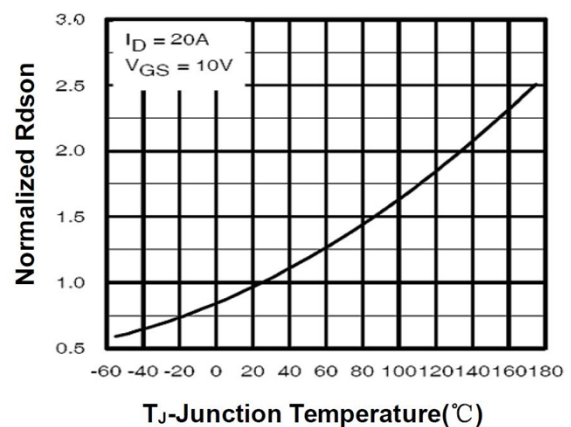


Figure 7. Gate Charge Waveforms

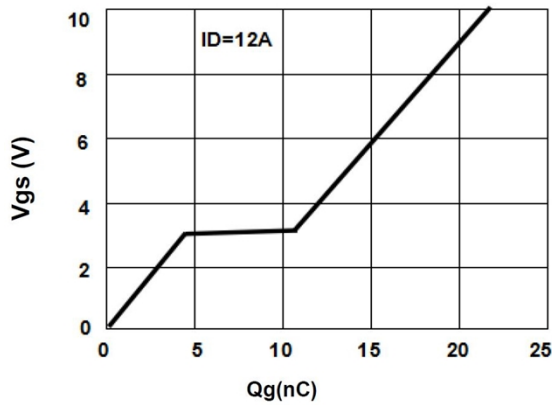


Figure 8. Capacitance

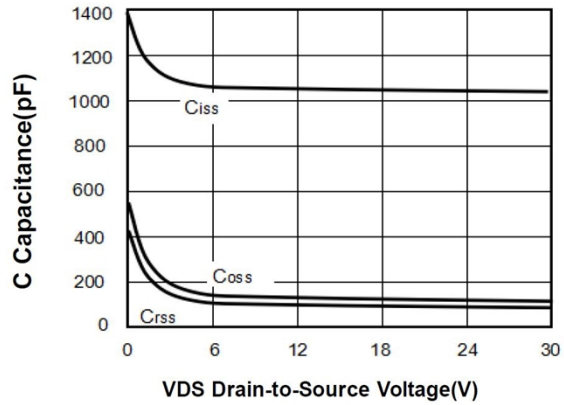


Figure 9. Body-Diode Characteristics

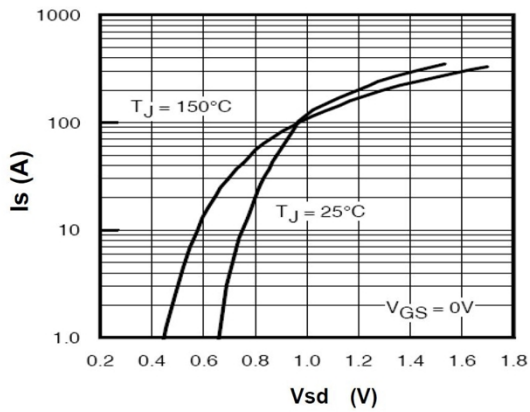


Figure 10. Maximum Safe Operating Area

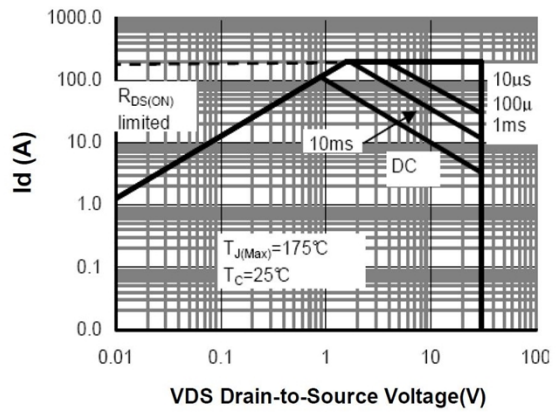
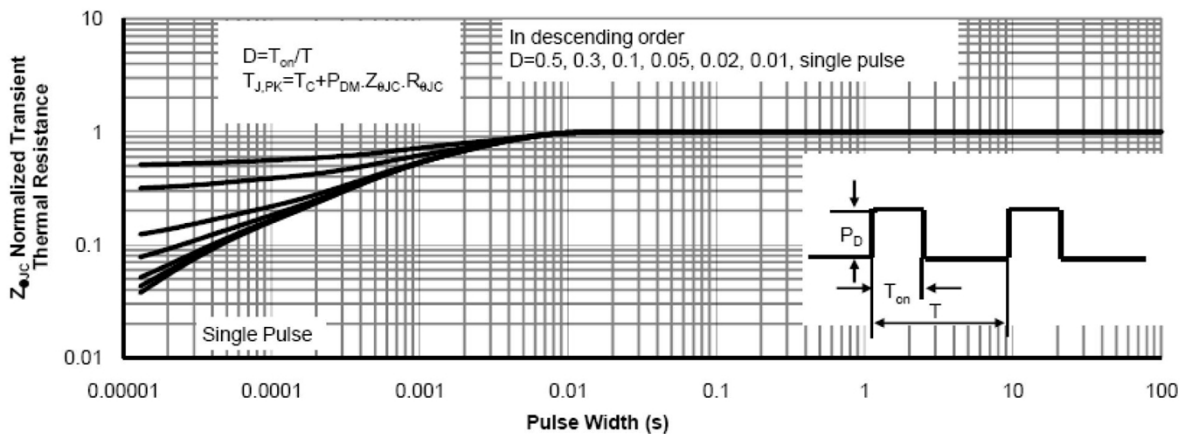
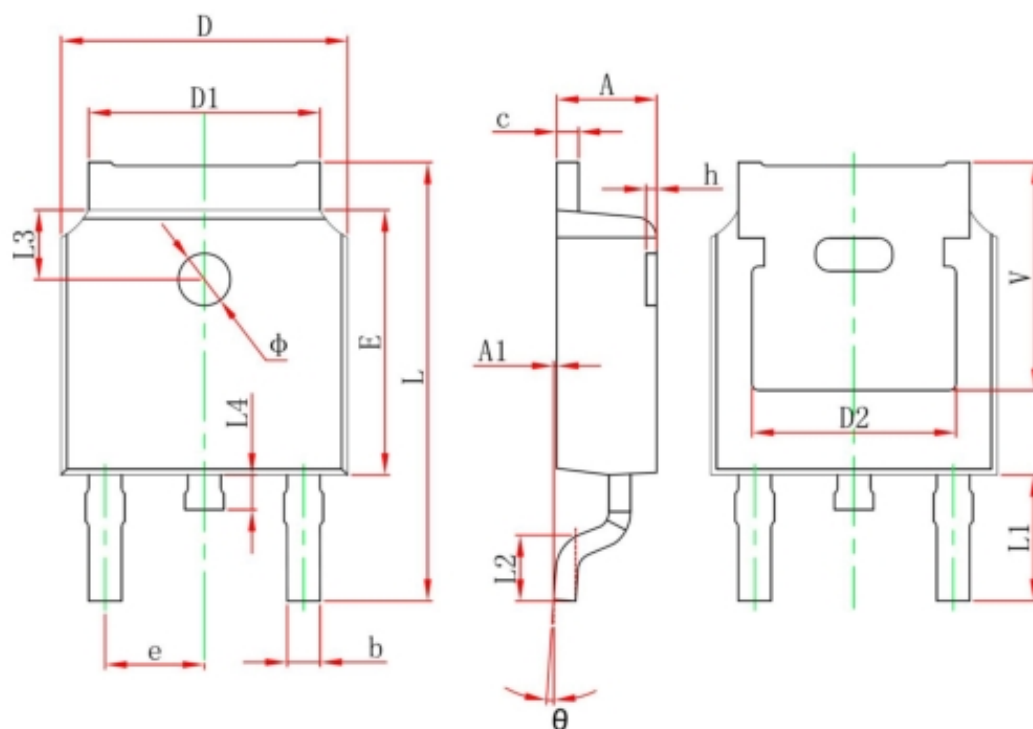


Figure 11. Normalized Maximum Transient Thermal Impedance



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.	