

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-30V	6mΩ@-10V	-60A
	9mΩ@-4.5V	

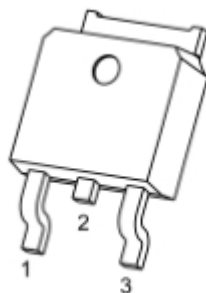
Feature

- $V_{DS} = -30V, I_D = -60A$
- $R_{DS(ON)} < 8m\Omega @ V_{GS} = -10V$ $R_{DS(ON)} < 13m\Omega @ V_{GS} = -4.5V$
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation
- Pb free terminal plating
- RoHS compliant
- Halogen free

Application

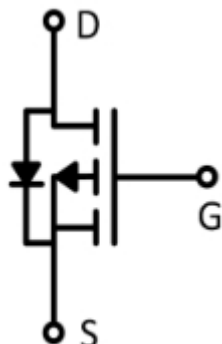
- High side switch for full bridge converter
- DC/DC converter for LCD display

Package

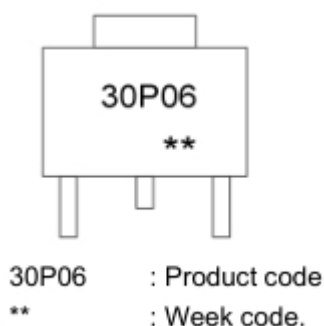


TO-252-2L(G:1 D:2 S:3)

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
Drain Current-Continuous	I_D	-60	A
Drain Current-Continuous($T_c=100^{\circ}\text{C}$)		-42	
Drain Current-Pulsed ⁽¹⁾	I_{DM}	-240	A
Maximum Power Dissipation	P_D	110	W
Single pulse avalanche energy ⁽⁵⁾	E_{AS}	450	mJ
Thermal Resistance,Junction-to- Case ⁽²⁾	$R_{\theta JC}$	1.34	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	$^{\circ}\text{C}$

Electrical characteristics

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

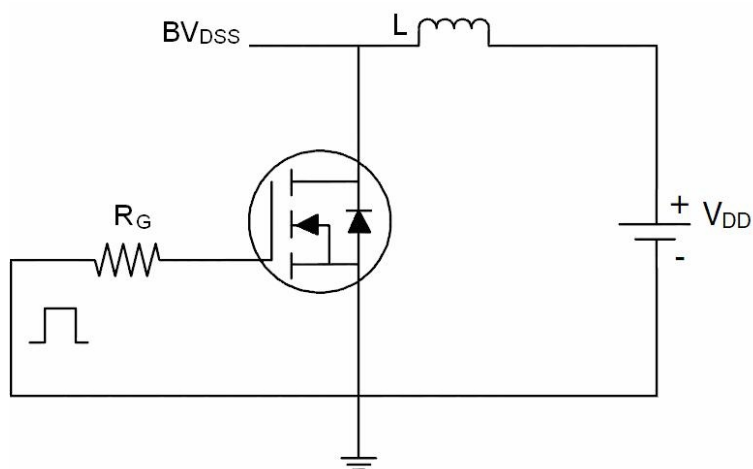
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V _{GS} = 0V, I _D = -250μA	-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30V, V _{GS} = 0V			-1	μA
Gate-Source Leakage	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	μA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1	-1.5	-2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -20A		6	8	mΩ
		V _{GS} = -4.5V, I _D = -15A		9	13	
Dynamic Characteristics						
Input Capacitance	C _{iSS}	V _{DS} = -15V, V _{GS} = 0V, f = 1MHz		4320		pF
Output Capacitance	C _{oSS}			534		
Reverse Transfer Capacitance	C _{rSS}			493		
Total Gate Charge	Q _g	V _{DS} = -15V, I _D = -15A , V _{GS} = -10V		45		nC
Gate-Source Charge	Q _{gs}			8		
Gate-Drain Charge	Q _{gd}			12		
Switching Characteristics						
Turn-on Delay Time	T _{d(on)}	V _{DD} = -15V, I _D = -15A V _{GS} = -10V, R _{GEN} = 2.5Ω		19		nS
Turn-on Rise Time	T _r			15		
Turn-off Delay Time	T _{d(off)}			65		
Turn-off Fall Time	T _f			36		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = -55A			-1.2	V

Note:

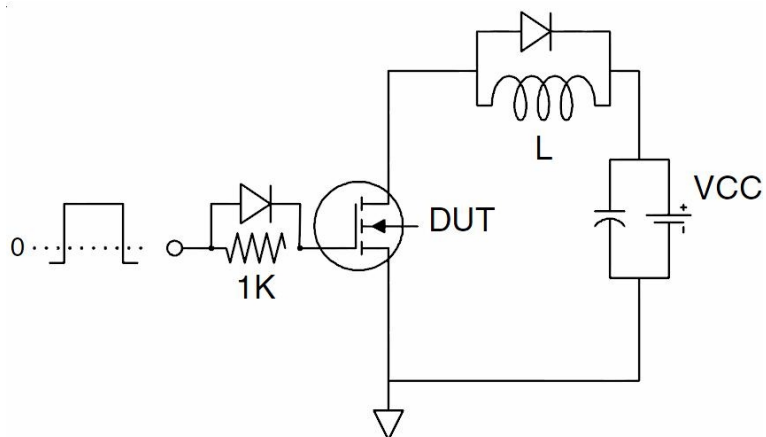
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. E_{AS} condition: $T_j = 25^{\circ}\text{C}, V_{DD} = -15V, V_G = -10V, L = 0.5mH, R_g = 25\Omega$

Test Circuit

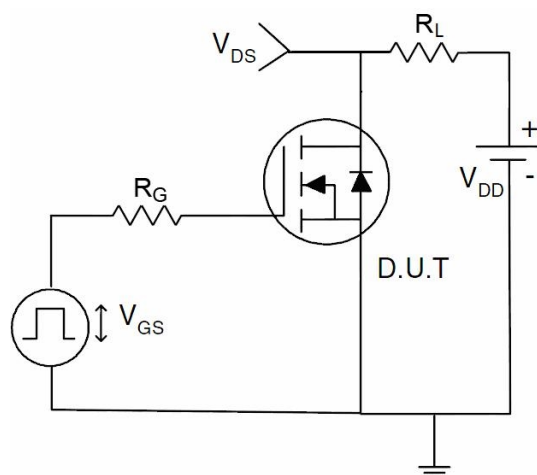
- EAS Test Circuits



- Gate Charge Test Circuit



- Switch Time Test Circuit



Typical Characteristics

Figure 1: Output Characteristics

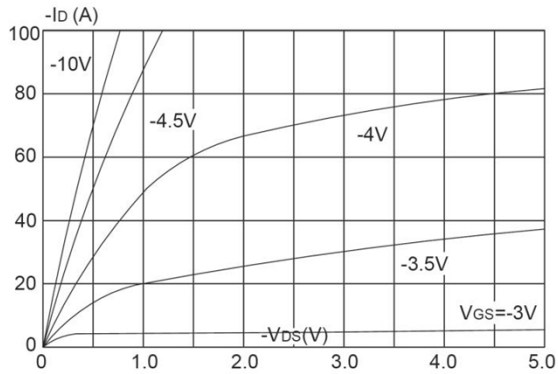


Figure 2: Typical Transfer Characteristics

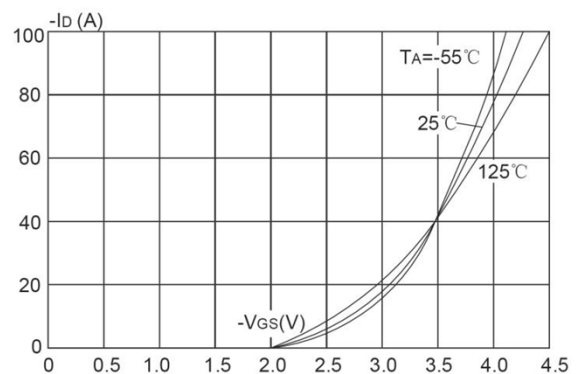


Figure 3: On-resistance vs. Drain Current

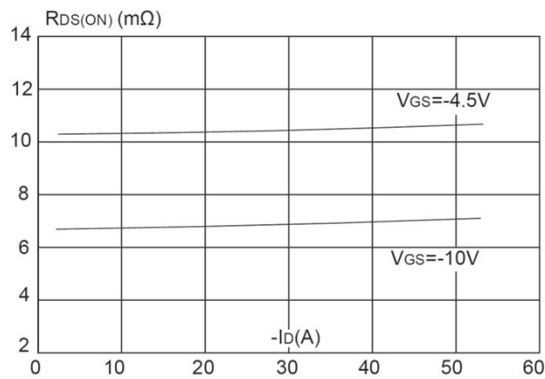


Figure 4: Body Diode Characteristics

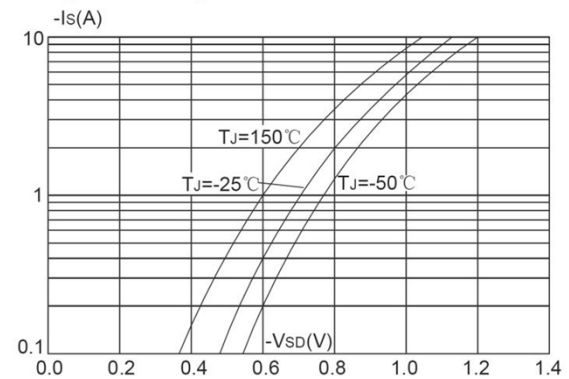


Figure 5: Gate Charge Characteristics

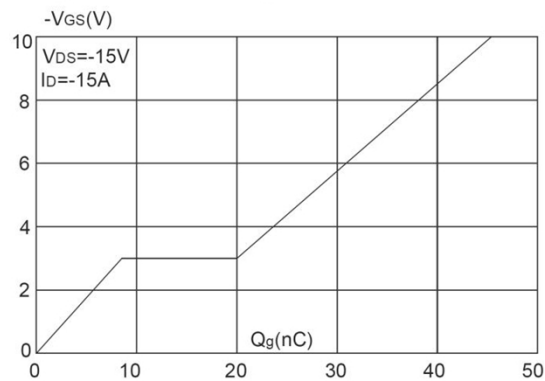


Figure 6: Capacitance Characteristics

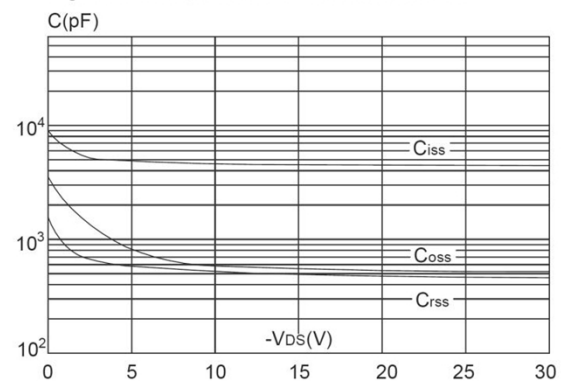


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

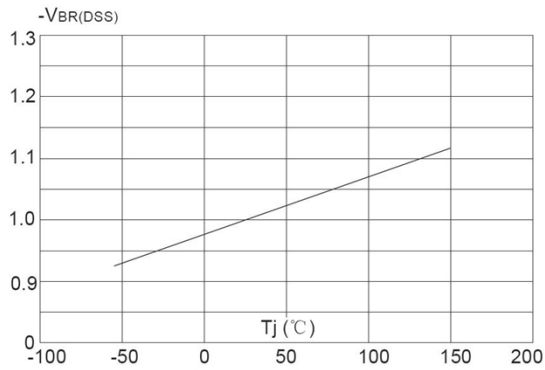


Figure 8: Normalized on Resistance vs. Junction Temperature

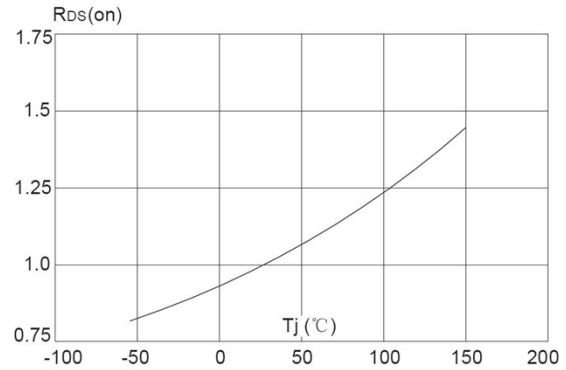


Figure 9: Maximum Safe Operating Area

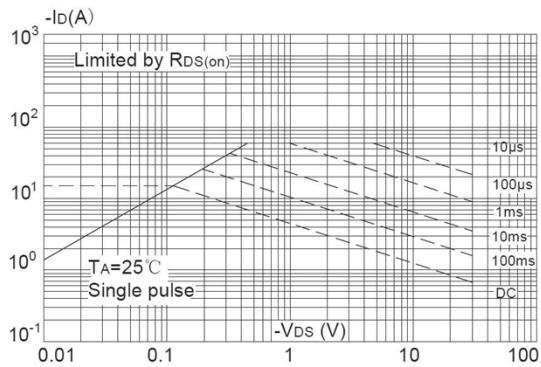


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

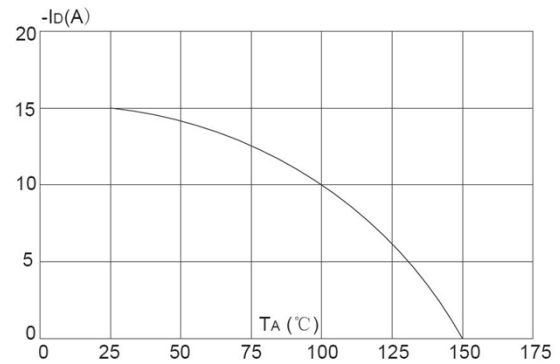
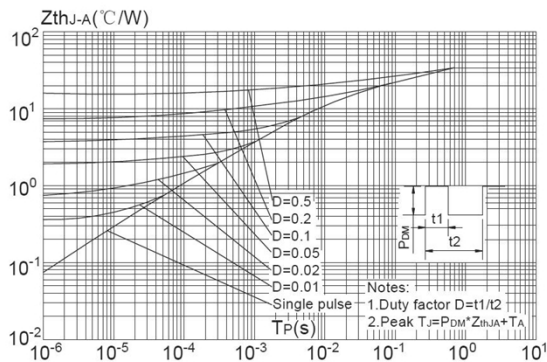
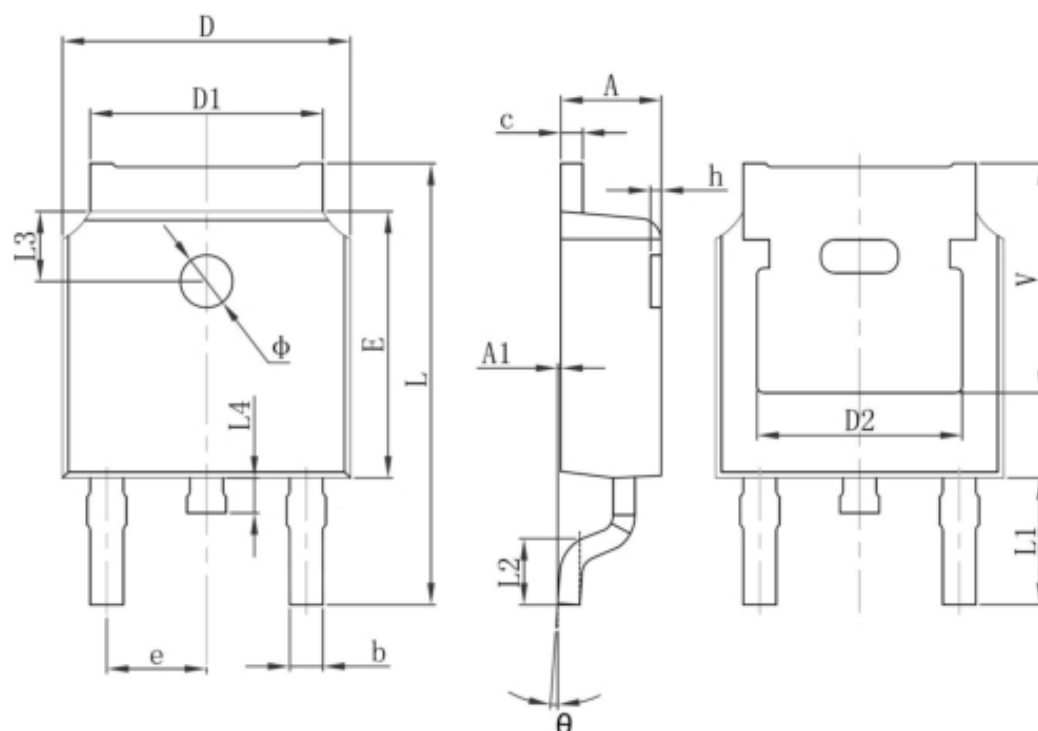


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



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.	