

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-30V	20mΩ@-10V	-20A
	28mΩ@-4.5V	

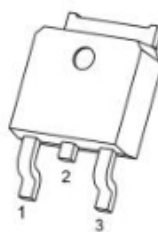
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Application

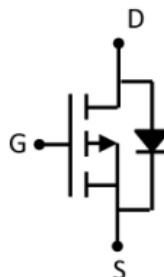
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

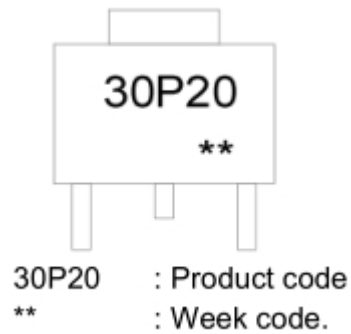


TO-252-2L(G:1 D:2 S:3)

Circuit diagram



Marking



Absolute maximum ratings

(T_a=25°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	-20	A
Pulsed Drain Current	I _{DM}	-80	A
Maximum Power Dissipation(T _c =25°C)	P _D	50	W
Single pulse avalanche energy ^(Note 5)	E _{AS}	169	mJ
Thermal Resistance,Junction-to-Case	R _{θJC}	2.5	W
Thermal Resistance,Junction-to-Ambient	R _{θJA}	55	°C
Single pulse avalanche energy ^(Note 5)	E _{AS}	169	mJ
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55~ +150	°C

Electrical characteristics

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

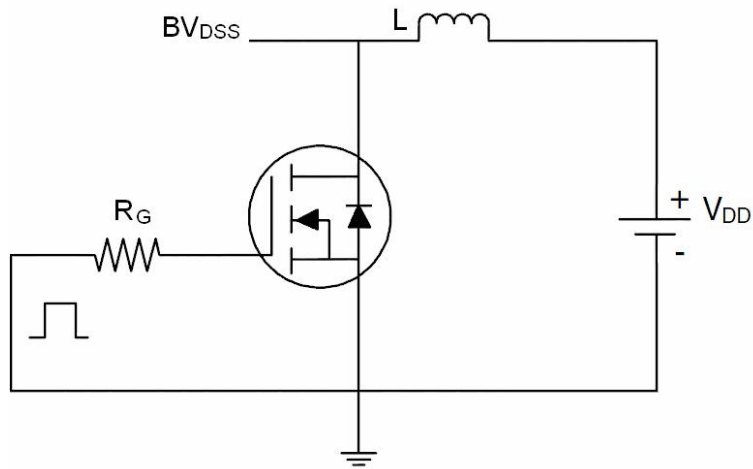
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$BV_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$			-1	μA
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	μA
On Characteristics (Note 3)						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.6	-2.5	V
Drain-Source On-Resistance ¹	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -20A$		20	25	m Ω
		$V_{GS} = -4.5V, I_D = -15A$		28	35	
Forward Transconductance	g_{FS}	$V_{GS} = -5V, I_D = -20A$		25		S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1MHz$		885		pF
Output Capacitance	C_{oss}			163		
Reverse Transfer Capacitance	C_{rss}			137		
Switching Characteristics (Note 4)						
Turn-on Delay Time	$T_{d(on)}$	$V_{DD} = -30V, R_L = 3\Omega,$ $V_{GS} = -10V, R_G = 2.5\Omega$		9		nS
Turn-on Rise Time	T_r			10		
Turn-off Delay Time	$T_{d(off)}$			50		
Turn-off Fall Time	T_f			20		
Total Gate Charge	Q_g	$V_{DS} = -15V, I_D = -15A,$ $V_{GS} = -10V,$		20		nC
Gate-Source Charge	Q_{gs}			1.7		
Gate-Drain Charge	Q_{gd}			6		
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$I_{SD} = -15A, V_{GS} = 0V$			-1.2	V
Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}C, I_F = -15A$		24		nS
Reverse Recovery Charge	Q_{rr}	$di/dt = -100A/\mu s$ (Note3)		16		nC

Note:

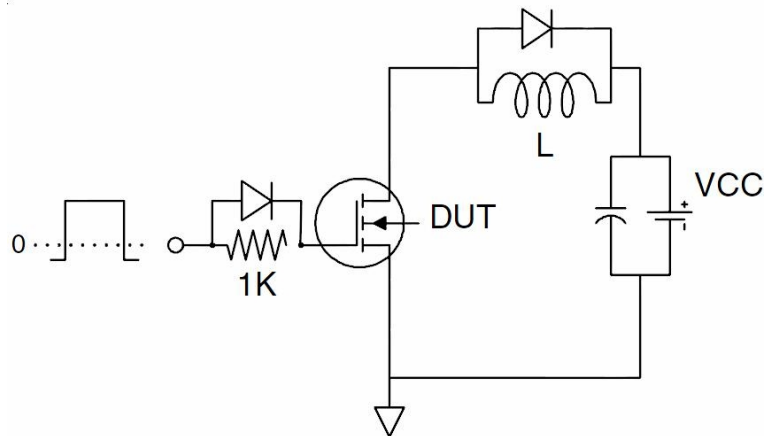
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition: $T_J = 25^{\circ}\text{C}, V_{DD} = 15V, V_G = 10V, L = 0.5mH, R_g = 25\Omega, I_{AS} = 26A$

Test Circuits

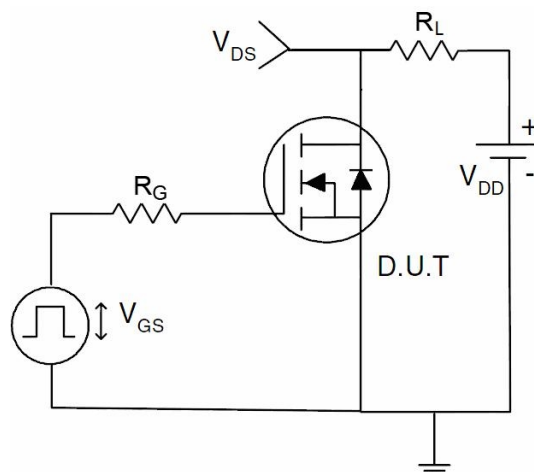
- EAS Test Circuits



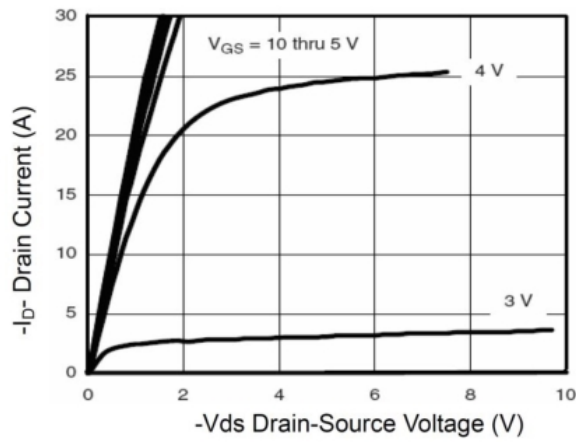
- Gate Charge Test Circuit



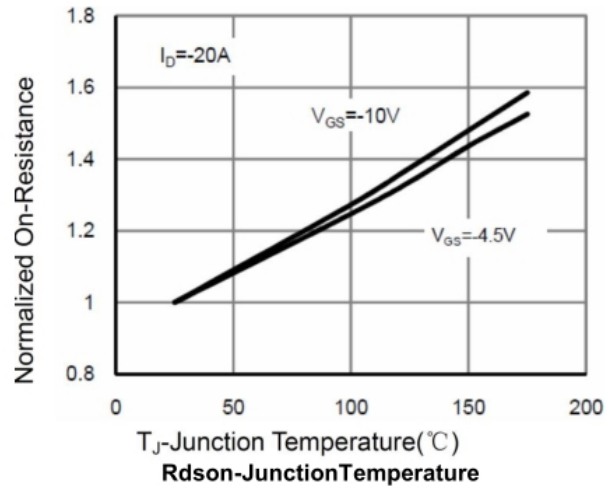
- Switch Time Test Circuit



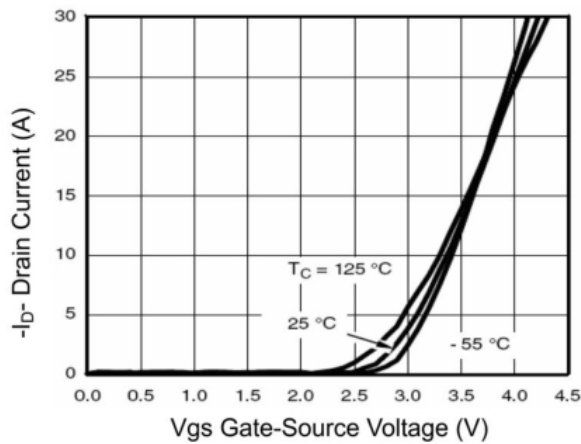
Typical Characteristics



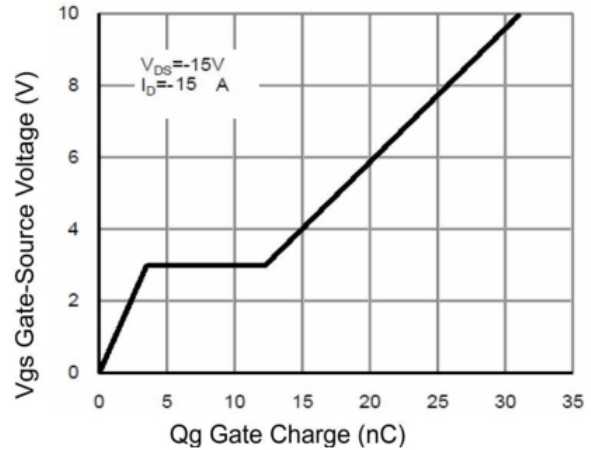
Output Characteristics



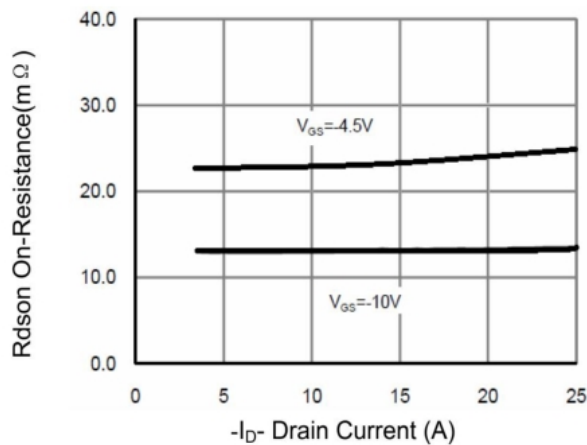
Rdson-Junction Temperature



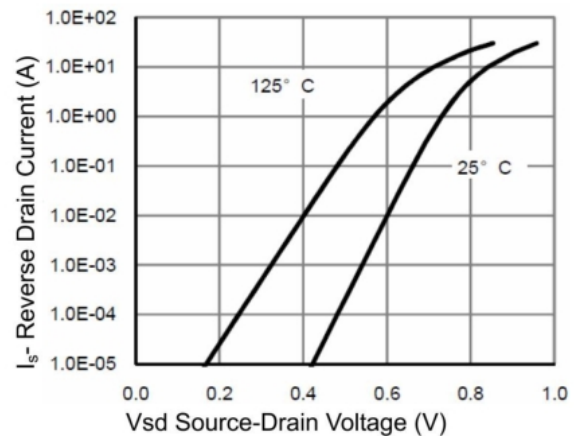
Transfer Characteristics



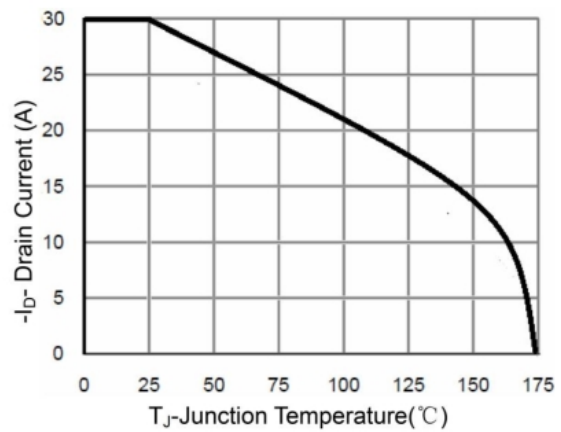
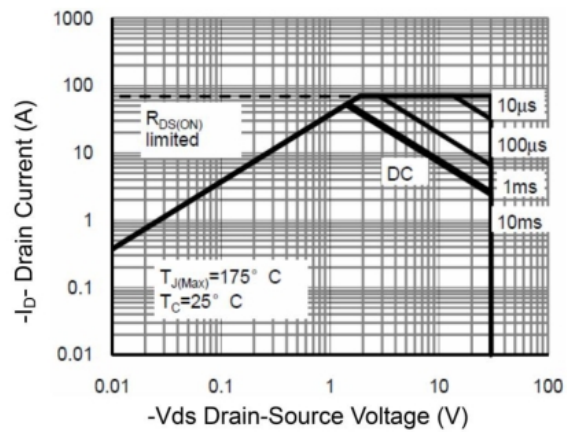
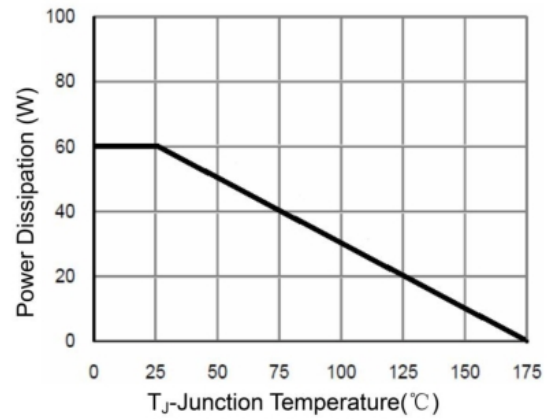
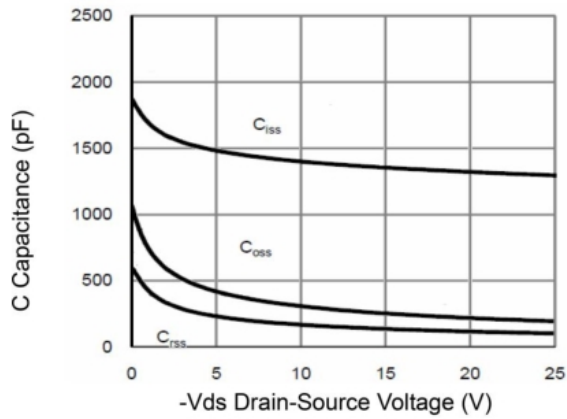
Gate Charge



Rdson- Drain Current

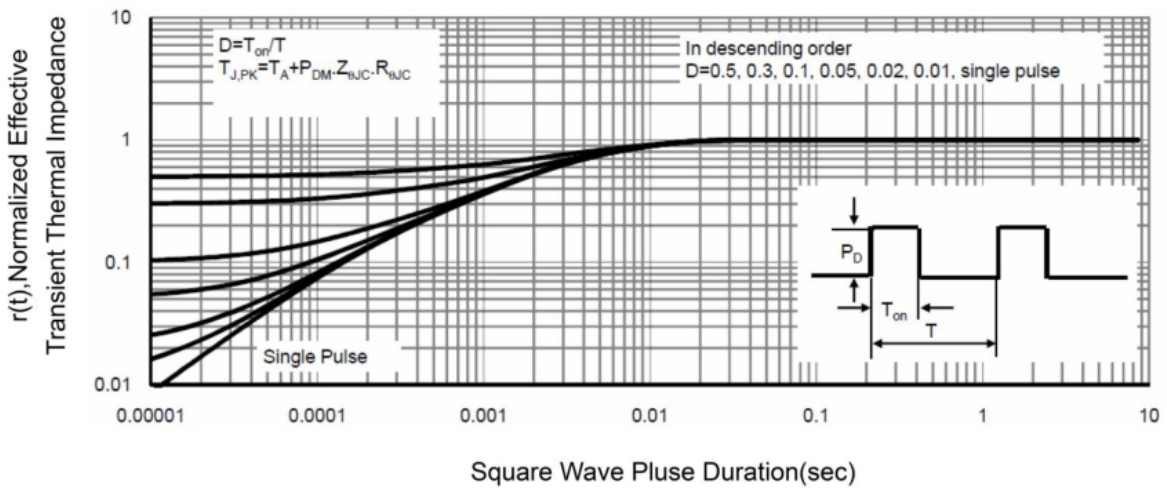


Source- Drain Diode Forward



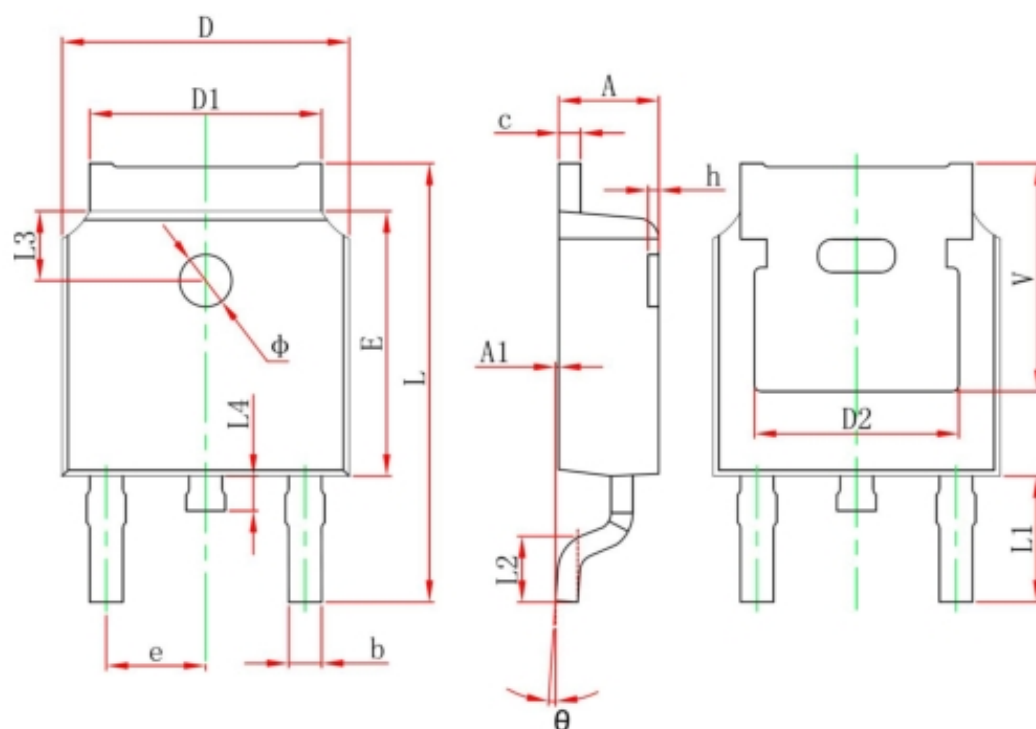
Safe Operation Area

ID Current Derating



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.	