

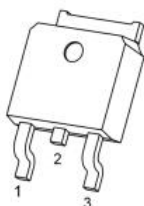
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-20V	6.6mΩ@-4.5V	-55A
	8mΩ@-2.5V	

Feature

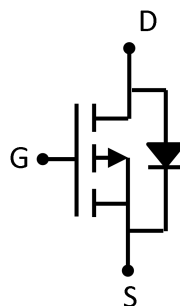
- Super Low Gate Charge
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

Package

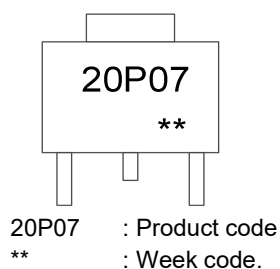


TO-252-2L(G:1 D:2 S:3)

Circuit diagram



Marking



**Absolute maximum ratings (Ta=25°C unless otherwise noted)**

Parameter	Symbol	Value	Unit
Drain-Source Voltage (VGS=0V)	V _{DS}	-20	V
Gate-Source Voltage (VDS=0V)	V _{GS}	±12	V
Drain Current-Continuous(Tc=25°C)	I _D	-55	A
Pulsed Drain Current	I _{DM}	-220	A
Maximum Power Dissipation(Tc=25°C)	P _D	38	W
Single pulse avalanche energy ¹	E _{AS}	125	mJ
Thermal Resistance,Junction-to-Case	R _{θJC}	2.8	°C/W
Thermal Resistance,Junction-to-Ambient	R _{θJA}	62	°C/W
Operating Junction and Storage Temperature Range	T _J ,T _{STG}	-55 To 150	°C

Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
Static Characteristic						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	VGS=0V,ID= -250μA	-20	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	VDS = -20V, VGS = 0V,	-	-	-1	μA
Gate to Body Leakage Current	I _{GSS}	VDS =0V, VGS = ±12V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	VDS= VGS, ID= -250μA	-0.35	-0.65	-1	V
Static Drain-Source on-Resistance	R _{DS(on)}	VGS =-4.5V, ID =-15A	-	6.6	9	mΩ
		VGS =-2.5V, ID =-12A	-	8	12	
Dynamic Characteristics						
Input Capacitance	C _{iss}	VDS =-10V, VGS =0V, f = 1.0MHz	-	4600	-	pF
Output Capacitance	C _{oss}		-	460	-	
Reverse Transfer Capacitance	C _{rss}		-	459	-	
Total Gate Charge	Q _g	VDS =-10V, ID =-15A, VGS =-4.5V	-	46	-	nC
Gate-Source Charge	Q _{gs}		-	7.3	-	
Gate-Drain(“Miller”) Charge	Q _{gd}		-	10	-	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	VDD =-10V, ID =-14A, RGEN=2.7Ω,VGS =-10V	-	8	-	ns
Turn-on Rise Time	t _r		-	59	-	
Turn-off Delay Time	t _{d(off)}		-	111	-	
Turn-off Fall Time	t _f		-	43	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current	I _S		-	-	-55	A
Drain to Source Diode Forward Voltage	V _{SD}	VGS = 0V, IS =-20A	-	-	-1.2	V
Reverse Recovery Time	t _{rr}	TJ=25℃,ISD=-15A,VGS=0V,	-	18	-	ns
Reverse Recovery Charge	Q _{rr}	di/dt=-100A/μs	-	7.7	-	nC

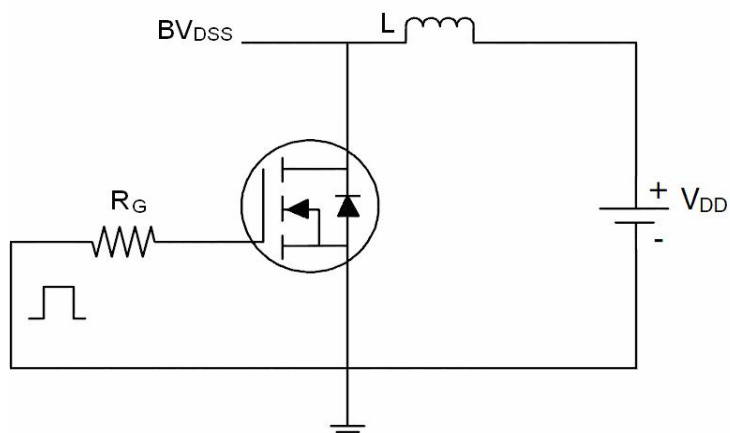
Note :

1. The EAS data shows Max. rating . The test condition is VDD=-10V,VG=-4.5V,L=0.5mH,Rg=25Ω

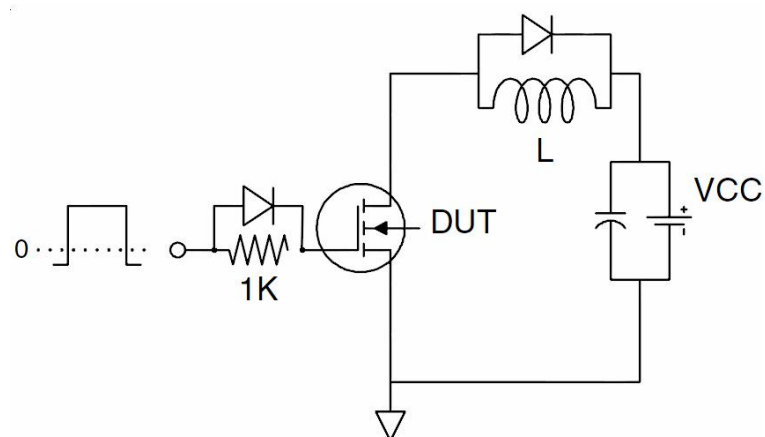


Test Circuit

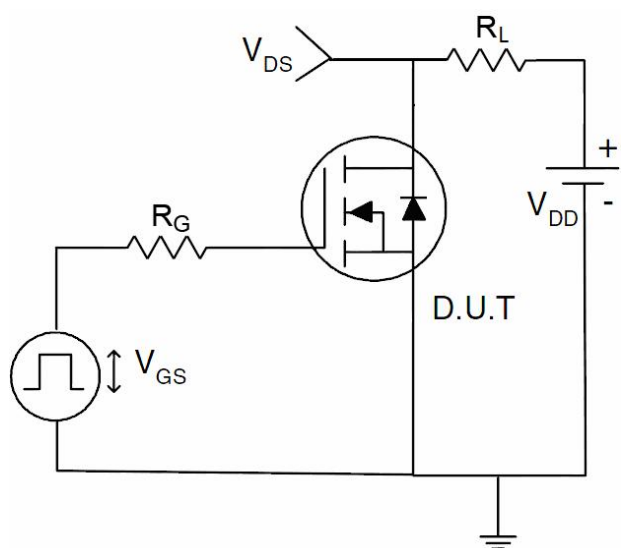
1) EAS Test Circuits



2) Gate Charge Test Circuit



3) Switch Time Test Circuit





Typical Characteristics

Figure1: Output Characteristics

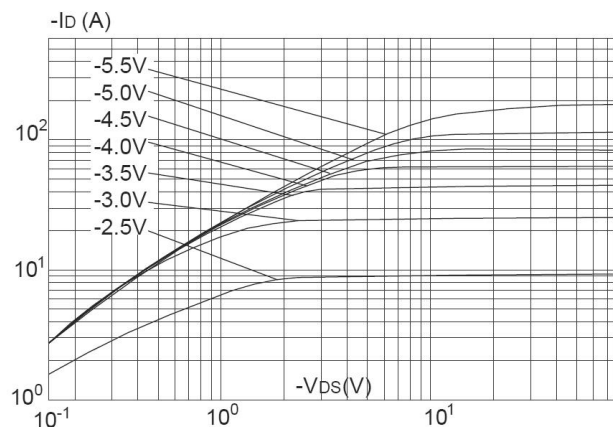


Figure 2: Typical Transfer Characteristics

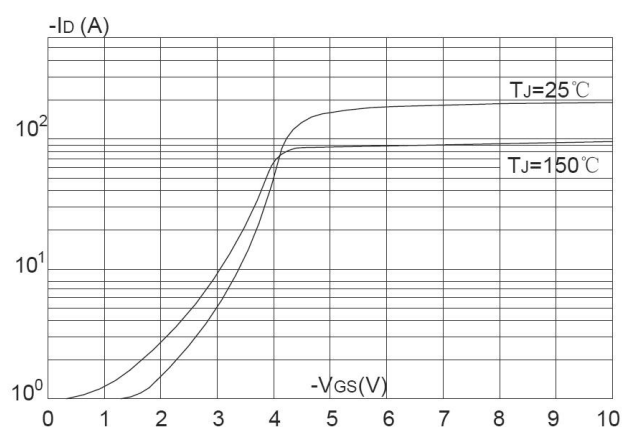


Figure 3: On-resistance vs. Drain Current

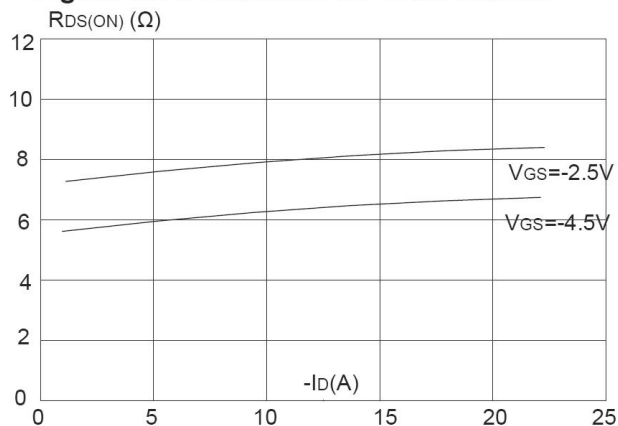


Figure 4: Body Diode Characteristics

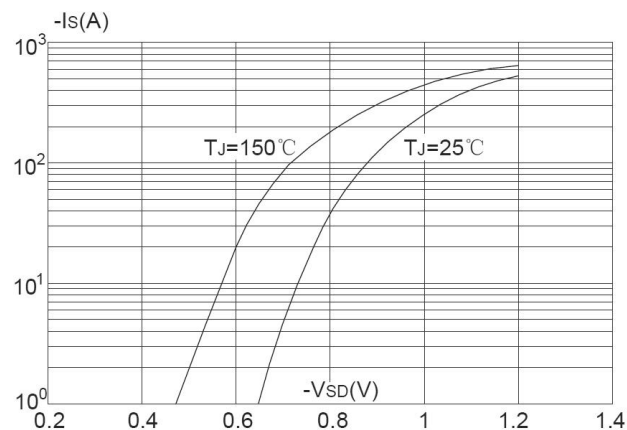


Figure 5: Gate Charge Characteristics

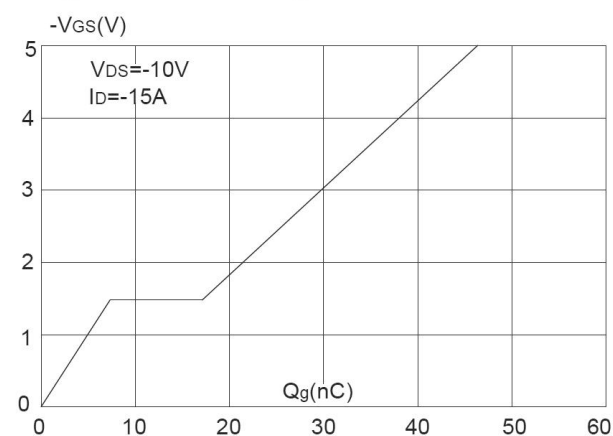


Figure 6: Capacitance Characteristics

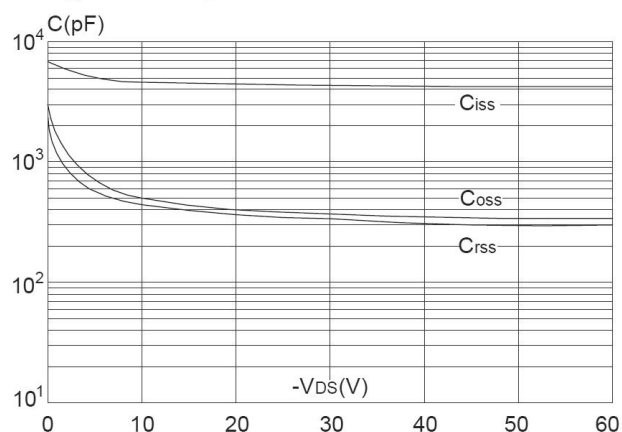




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

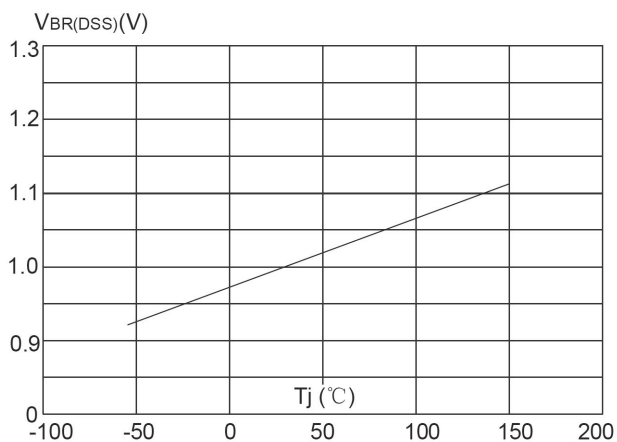


Figure 8: Normalized on Resistance vs. Junction Temperature

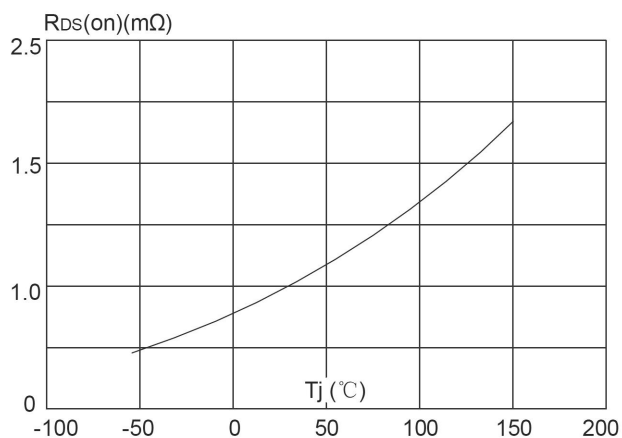


Figure 9: Maximum Safe Operating Area

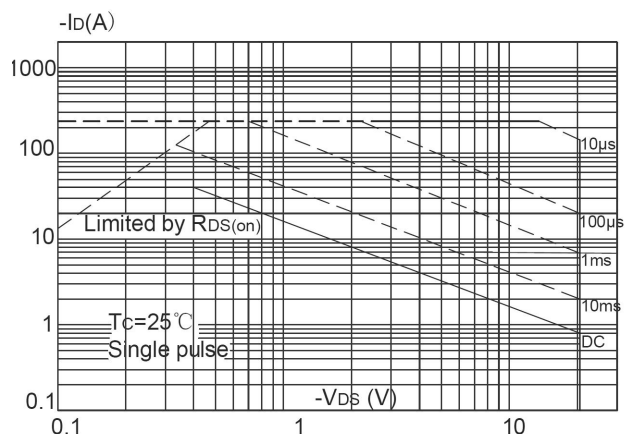


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

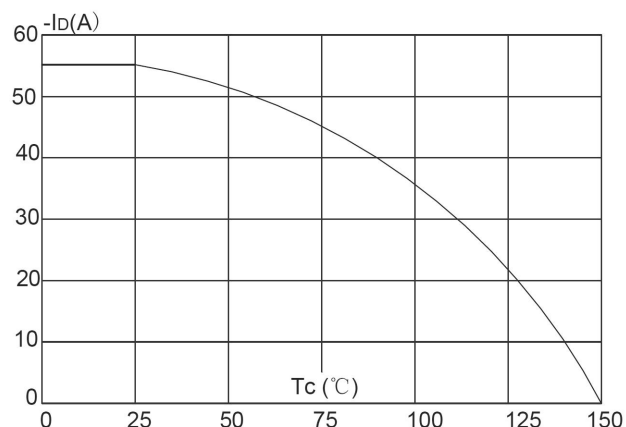
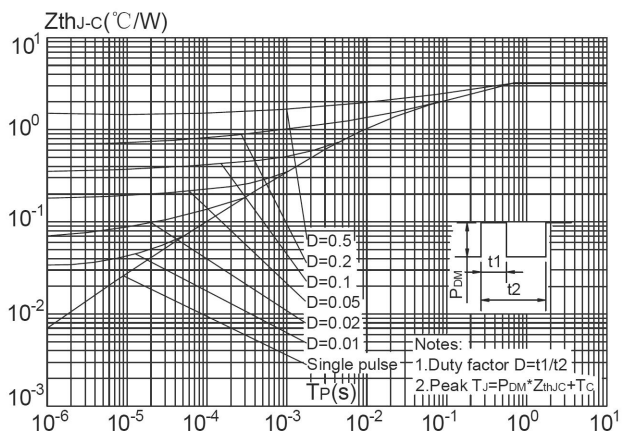
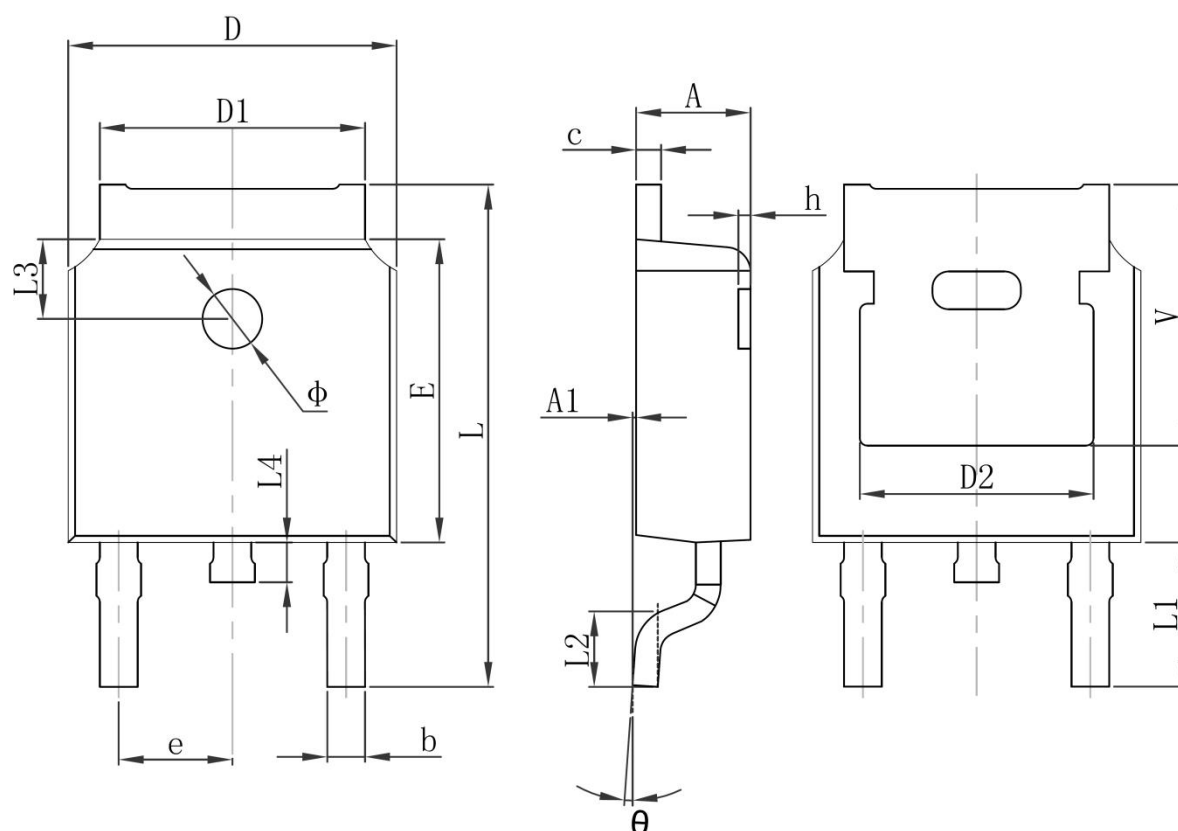


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



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.	

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