

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
500V	0.46Ω@10V	11A

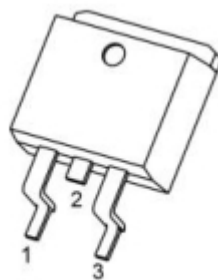
Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

Applications

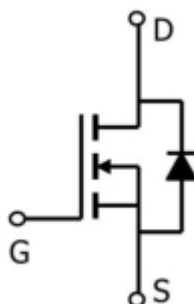
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

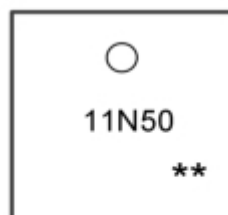


TO-263(G:1 D:2 S:3)

Circuit diagram



Marking



11N50
**

=Device Code
=Week Code

Absolute maximum ratings

(T_a=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	500	V
Gate-Source Voltage	V _{GS}	±30	V
Drain Current-Continuous(T _C = 25°C)	I _D	11	W
Pulsed Drain Current ²	I _{DM}	50	A
Single Pulse Avalanche Energy ³	E _{AS}	193	mJ
Total Power Dissipation ⁴ (T _C = 25°C)	P _D	165	W
Thermal Resistance Junction- Case ¹	R _{θJC}	0.75	°C/ W
Storage Temperature Range	T _{STG}	-55~ +150	°C
Operating Junction Temperature Range	T _J	-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_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	500			V
Bvdss Temperature Coefficient	$\Delta BV_{DSS}/\Delta T$	$I_D = 250\mu A$, Reference $25^{\circ}C$		0.66		V/ $^{\circ}C$
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 500V, V_{GS} = 0V$, $T_J = 25^{\circ}C$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 30V, V_{DS} = 0V$			± 100	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 5.5A$		0.46	0.65	Ω
Dynamic characteristics ⁴						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V$, $f = 1MHz$		980		pF
Output Capacitance	C_{oss}			144		
Reverse Transfer Capacitance	C_{rss}			13		
Switching Characteristics						
Total Gate Charge(4.5V)	Q_g	$V_{DS} = 400V, V_{GS} = 10V$, $I_D = 11A$		22		nC
Gate-Source Charge	Q_{gs}			6		
Gate-Drain Charge	Q_{gd}			10.5		
Turn-On Delay Time	$T_{d(on)}$	$V_{DD} = 250V, V_{GS} = 10V$, $R_G = 25\Omega, I_D = 11A$		24		nS
Rise Time	T_r			61		
Turn-Off Delay Time	$T_{d(off)}$			45		
Fall Time	T_f			37		

Note :

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating . The test condition is $I_D = 5A, L = 5mH$

Typical Characteristics

Figure 1. On-Region Characteristics

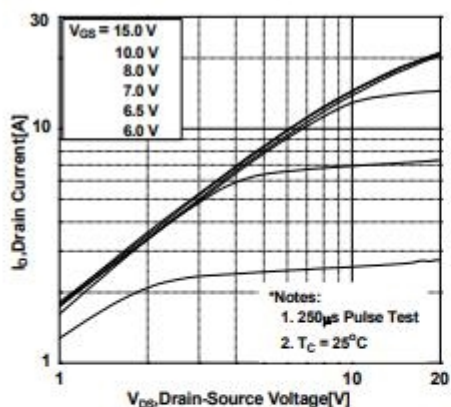


Figure 2. Transfer Characteristics

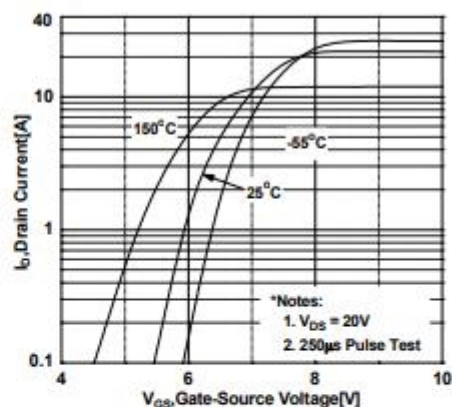


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

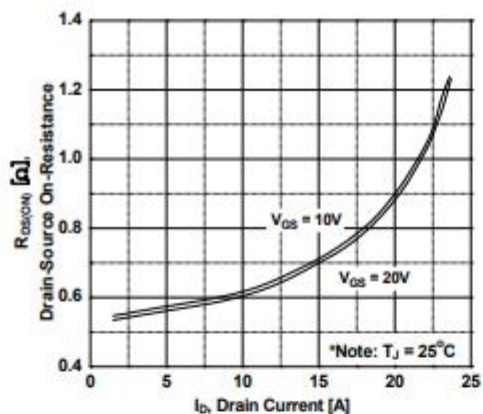


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

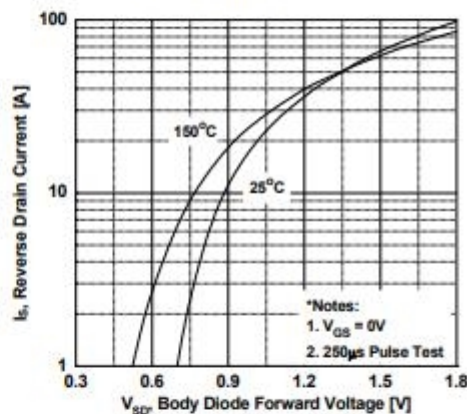


Figure 5. Capacitance Characteristics

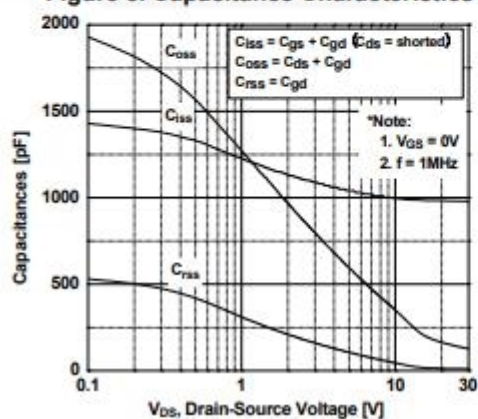


Figure 6. Gate Charge Characteristics

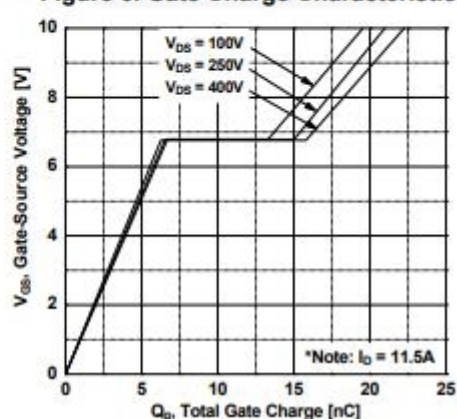


Figure 7. Breakdown Voltage Variation vs. Temperature

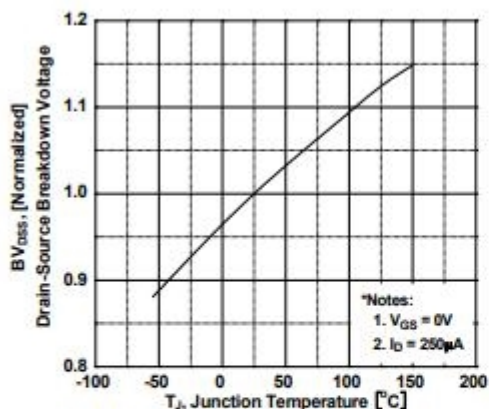


Figure 8. On-Resistance Variation vs. Temperature

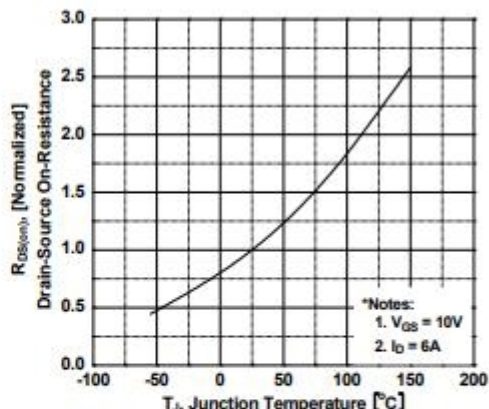


Figure 9. Maximum Safe Operating Area

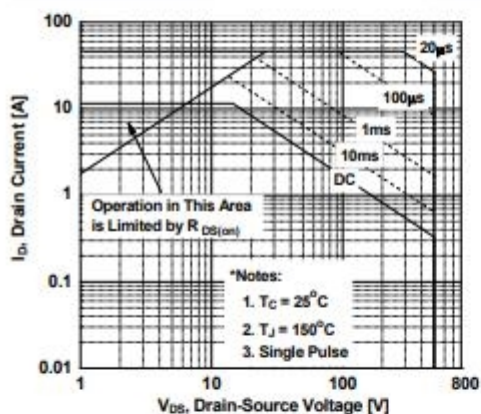


Figure 10. Maximum Drain Current vs. Case Temperature

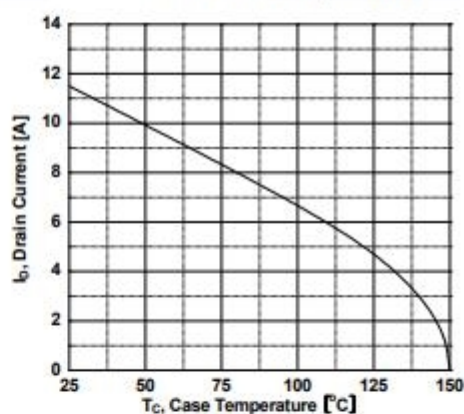
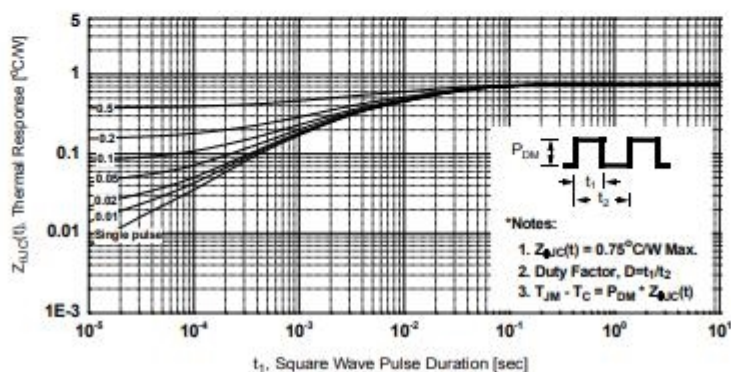
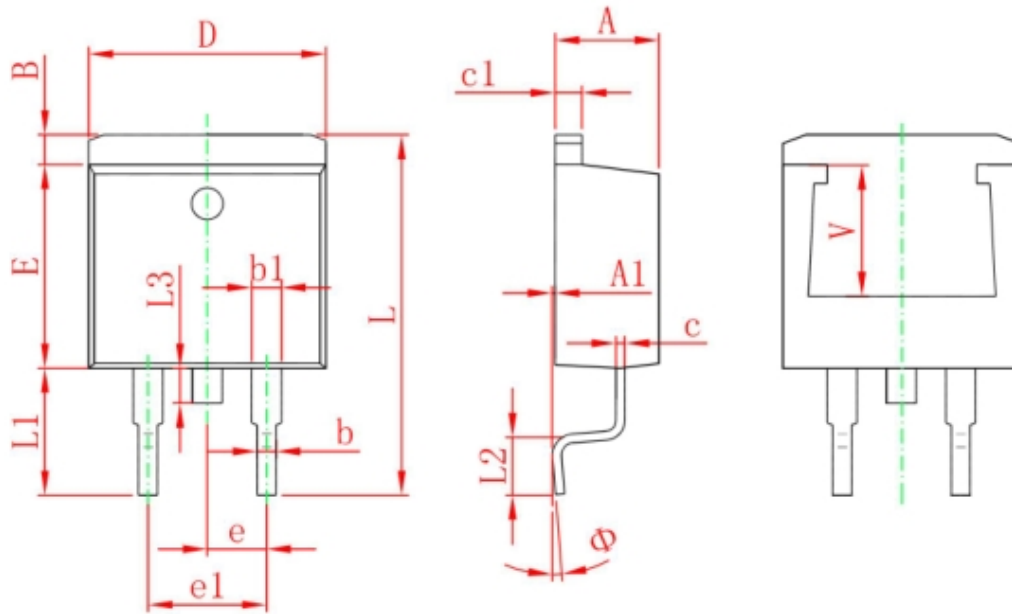


Figure 11. Transient Thermal Response Curve



TO-263 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	