

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
500V	0.68Ω@10V	9A

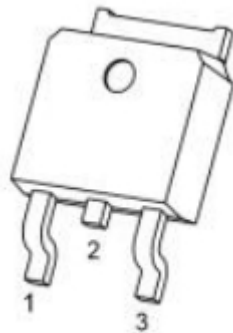
Feature

- Fast Switching
- Improved dv/dt capability
- 100% Single Pulse avalanche energy Test

Application

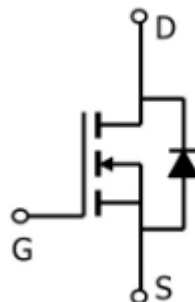
- DC Motor Control and Class D Amplifier
- Uninterruptible Power Supply (UPS)

Package

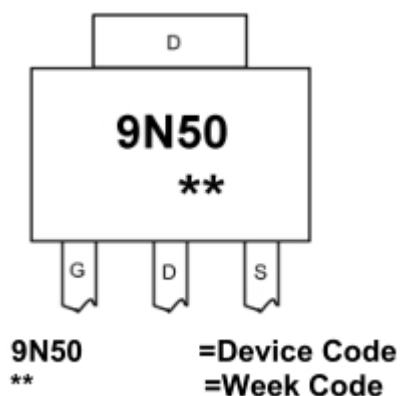


TO-252(G:1 D:2 S:3)

Circuit diagram



Marking



Absolute maximum ratings

(T_a=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	500	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current ¹ (T _C =25°C)	I _D	9	A
Pulsed Drain Current ²	I _{DM}	36	A
Single Pulse Avalanche Energy ³	E _{AS}	146	mJ
Total Power Dissipation(T _C =25°C)	P _D	178	W
Thermal Resistance Junction-Case ¹	R _{θJC}	0.7	°C/ W
Storage Temperature Range	T _{STG}	-55~ +150	°C
Operating Junction Temperature Range	T _J	-55~ +150	°C

Electrical characteristics

(T_A=25°C, unless otherwise noted)

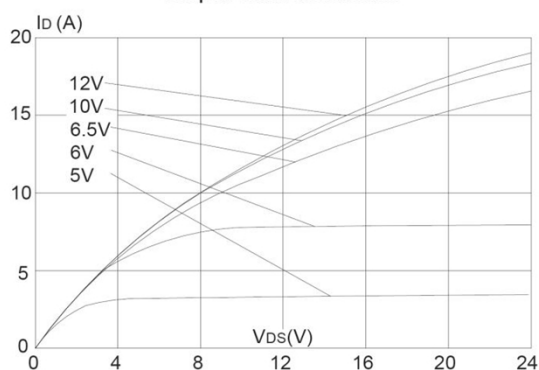
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	500			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =400V,V _{GS} = 0V T _J =25°C			1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} = 0V			±100	uA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
Static Drain-Source on-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =4.5A		0.68	0.85	Ω
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =25V,V _{GS} =0V, f=1MHz		1106		pF
Output Capacitance	C _{oss}			104		
Reverse Transfer Capacitance	C _{rss}			33		
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} =400V, V _{GS} =10V, I _D =9A		19.4		nC
Gate-Source Charge	Q _{gs}			4.7		
Gate-Drain Charge	Q _{gd}			7.2		
Turn-On Delay Time	T _{d(on)}	V _{DD} =250V, V _{GS} =10V, R _G =25Ω, I _D =9A		24		nS
Rise Time	T _r			45		
Turn-Off Delay Time	T _{d(off)}			57		
Fall Time	T _f			35		
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current	I _S				9	A
Maximum Pulsed Drain to Source Diode Forward Current	I _{SM}				36	A
Drain to Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _{SD} =9A			1.4	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, I _S =9A,		317		ns
Reverse Recovery Charge	Q _{rr}	di/dt=100A/μs		4.1		uC

Notes:

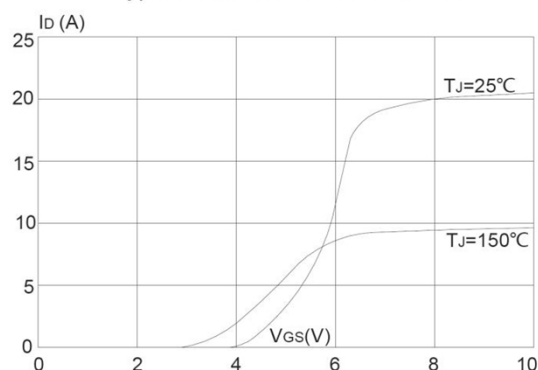
- 1 The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
3. The EAS data shows Max. rating . The test condition is R_G=25Ω ,L=10mH, V_{DD}=50V

Typical Characteristics

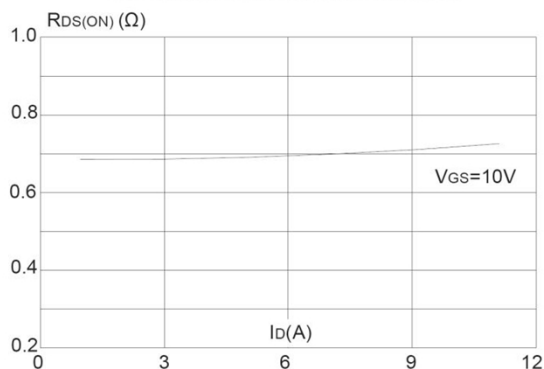
Output Characteristics



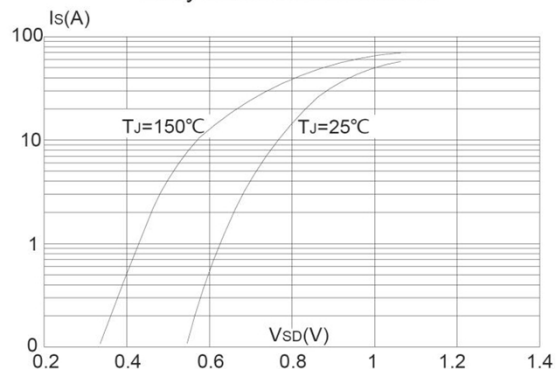
Typical Transfer Characteristics



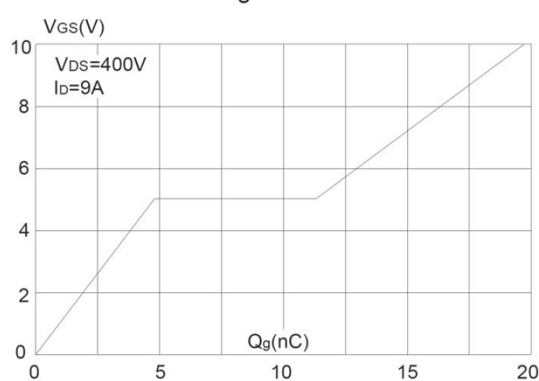
On-resistance vs. Drain Current



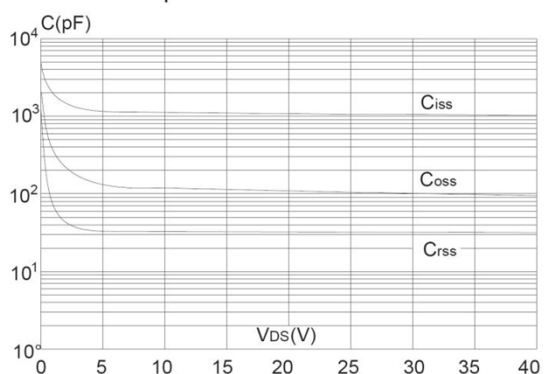
Body Diode Characteristics



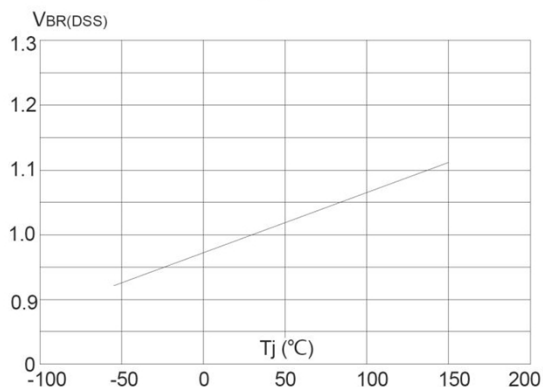
Gate Charge Characteristics



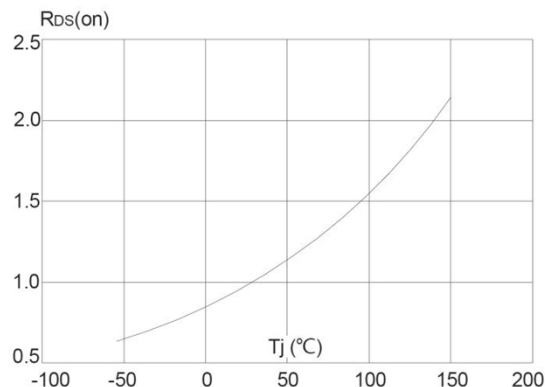
Capacitance Characteristics



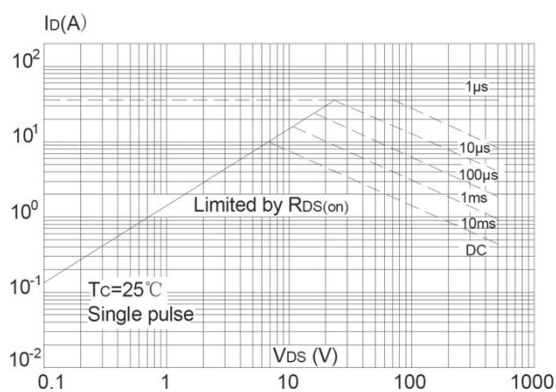
Normalized Breakdown Voltage vs. Junction Temperature



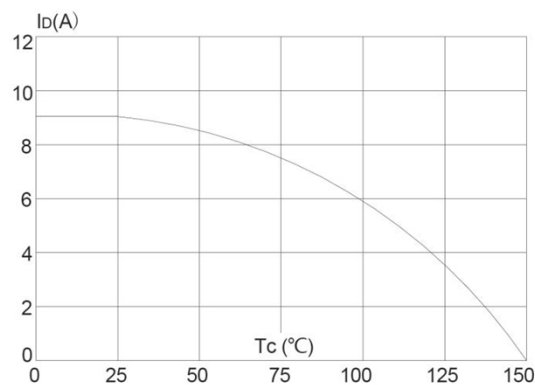
Normalized on Resistance vs. Junction Temperature



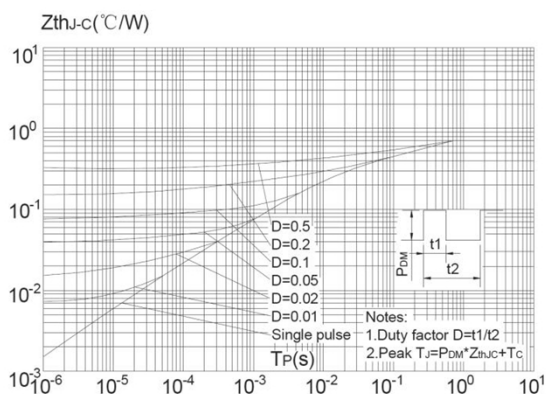
Maximum Safe Operating Area



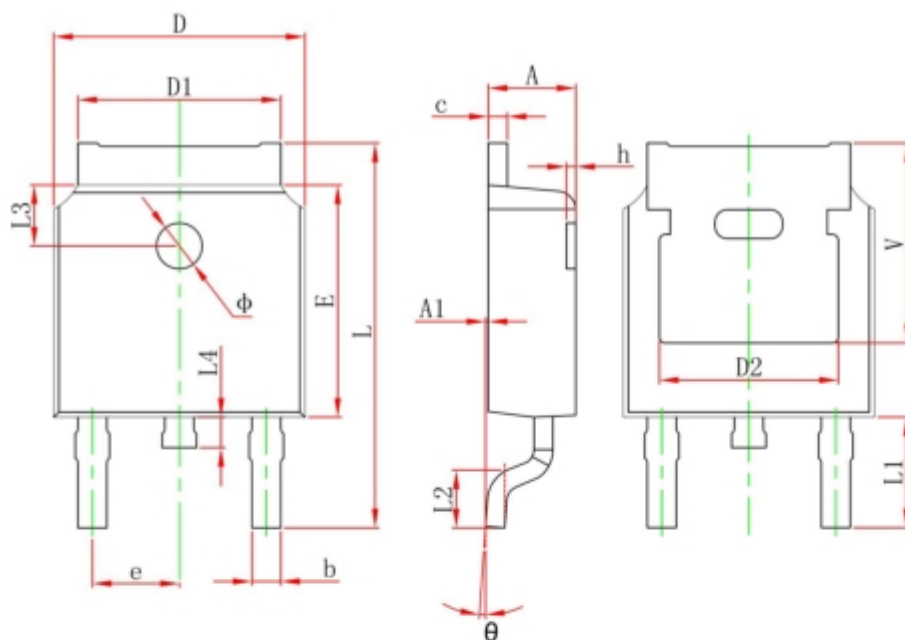
Maximum Continuous Drain Current vs. Case Temperature



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.	