Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
500V	0.3Ω@10V	18A

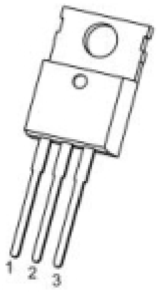
Feature

- Fast Switching
- Low Gate Charge and Rdson
- 100% Single Pulse avalanche energy Test

Applications

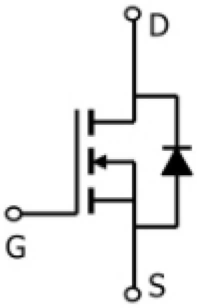
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

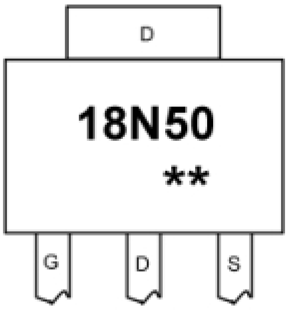


TO-220-3L-C(G:1 D:2 S:3)

Circuit diagram



Marking



18N50 **=Device Code**

****** **=Week Code**

Absolute maximum ratings

(T_a=25℃ unless otherwise noted)

Parameter	**Symbol**	**Value**	**Unit**
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current1(TC=25℃)	I_D	18	W
Pulsed Drain Current	I_{DM}	72	A
Single Pulse Avalanche Energy ^{3}	E_{AS}	809	mJ
Total Power Dissipation(TC=25℃)	P_D	190	W
Thermal Resistance Junction- Case^1	$R_{\theta JC}$	0.65	℃/ W
Storage Temperature Range	$T_{STG,}$	-55~ +150	℃
Operating Junction Temperature Range	$T_{J,}$	-55~ +150	℃

Electrical characteristics

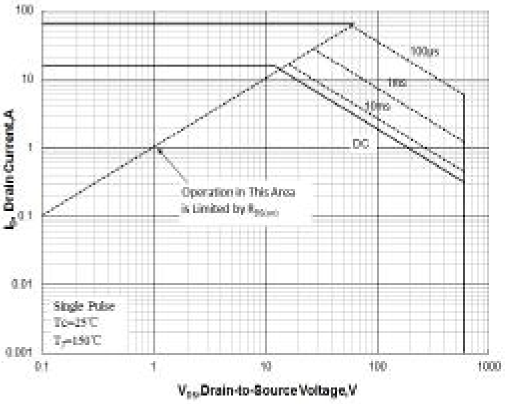
(T_A=25℃, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS} = 0V, I_D =250μA	500			V
Bvdss Temperature Coefficient	Δ BVDSS/ΔTJ	I_D=1mA, Reference25℃		0.36		V/℃
Drain-Source Leakage Current	I_{DSS}	V_{DS} =500V,V_{GS} = 0V , T_J=25℃			1	uA
Gate-body 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	3	4	5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =9A		0.3	0.4	Ω
Dynamic characteristics^4						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz		2620		pF
Output Capacitance	C_{oss}			220		
Reverse Transfer Capacitance	C_{rss}			6		
Switching Characteristics						
Total Gate Charge(4.5V)	Q_g	V_{DS}=400V, V_{GS}=10V, I_D=18A		46		nC
Gate-Source Charge	Q_{gs}			12.5		
Gate-Drain Charge	Q_{gd}			15.5		
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=250V, V_{GS}=10V, R_G=10Ω, I_D=18A		28		nS
Rise Time	T_r			47		
Turn-Off Delay Time	$T_{d(off)}$			57		
Fall Time	T_f			40		

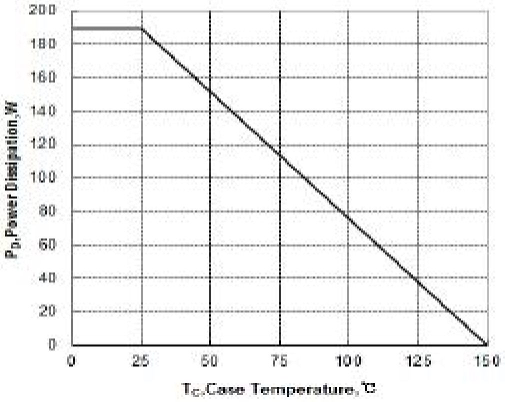
Note :

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 ≦ 300us , duty cycle ≦ 2%
3. The EAS data shows Max. rating . The test condition is R_G =25Ω ,L=10mH

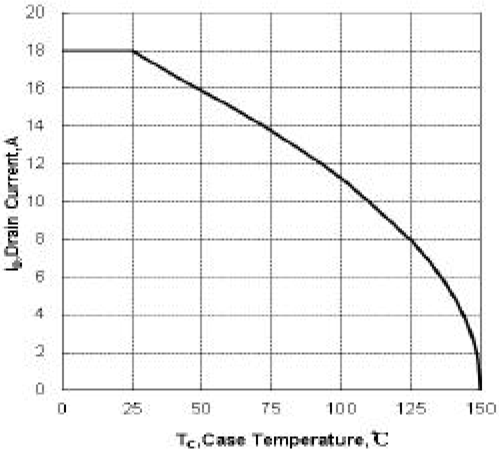
Typical Characteristics



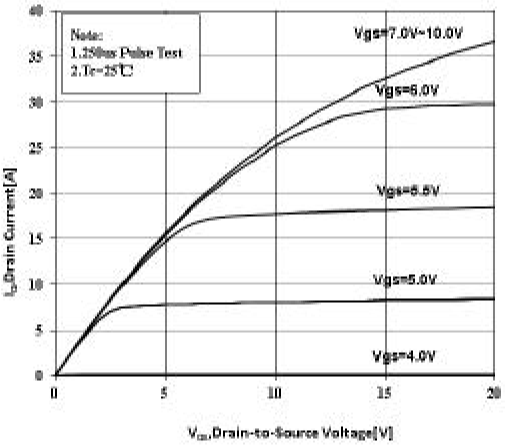
Maximum Forward Bias Safe Operating Area



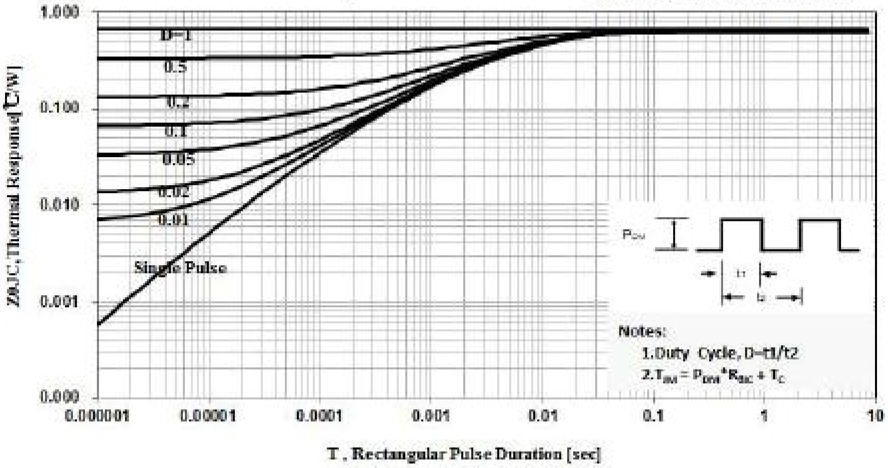
Maximum Power dissipation vs Case Temperature



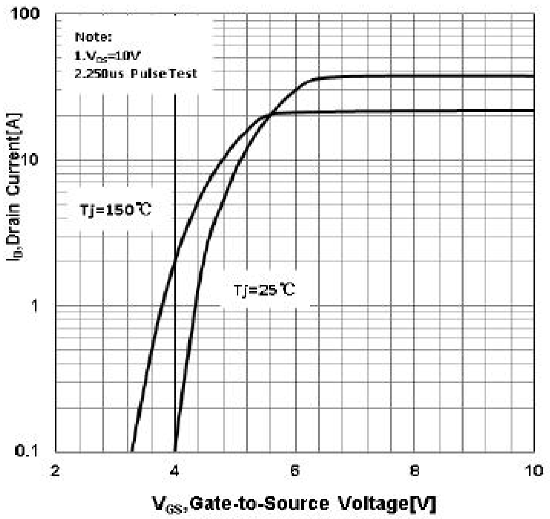
Maximum Continuous Drain Current vs Case Temperature



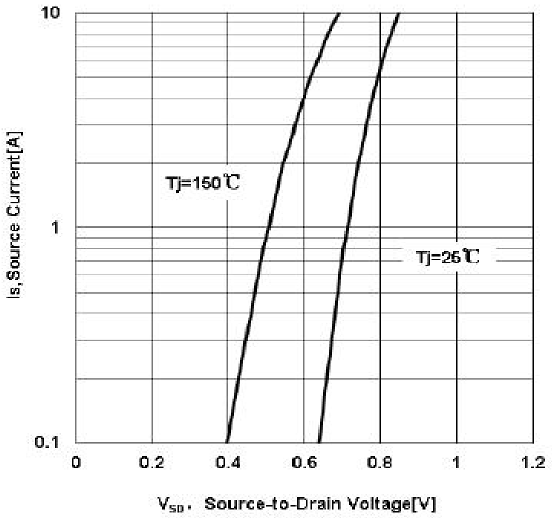
Typical Output Characteristics



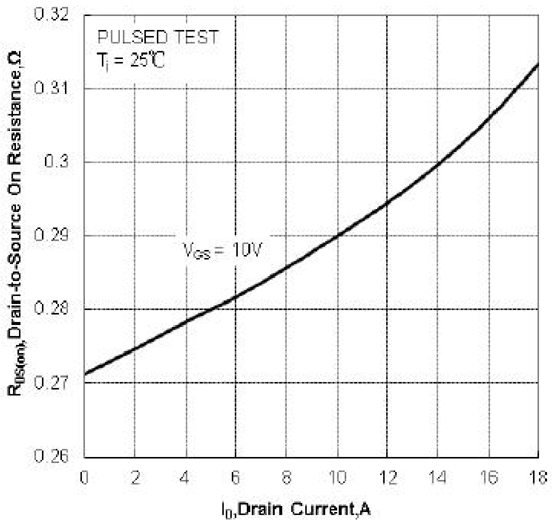
Maximum Effective Thermal Impedance , Junction to Case



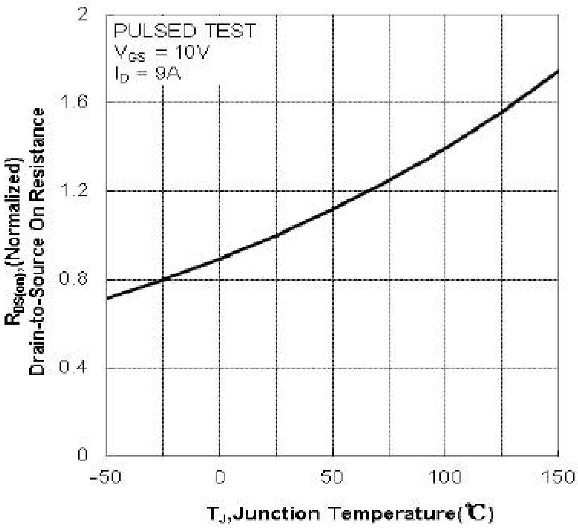
Typical Transfer Characteristics



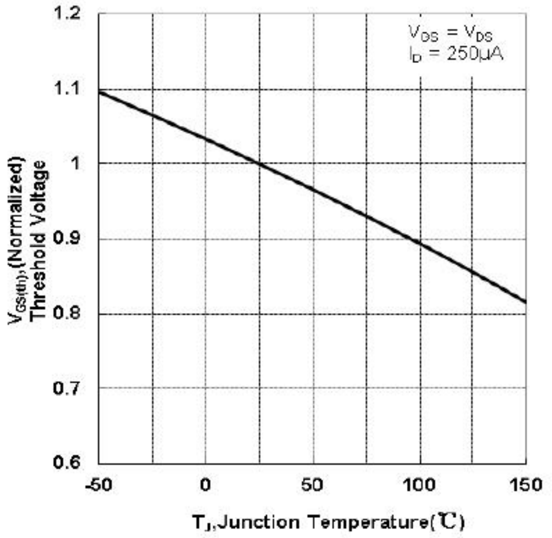
Typical Body Diode Transfer Characteristic



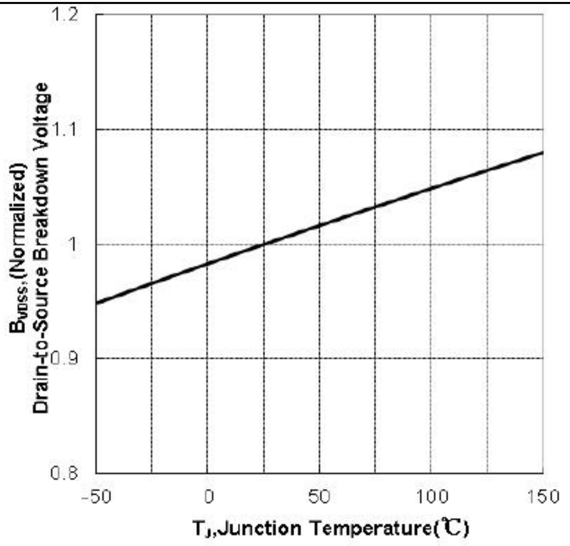
Typical Drain to Source ON Resistance
vs Drain Current



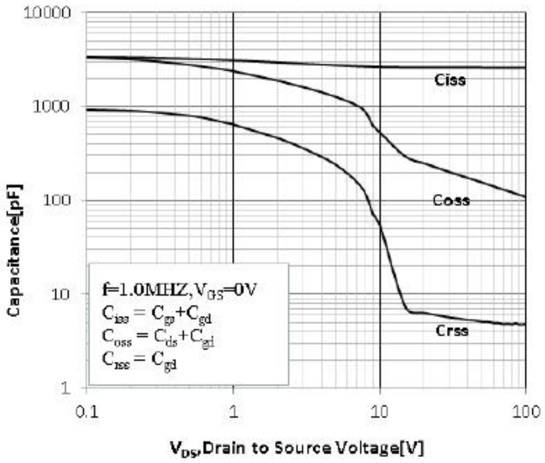
Typical Drian to Source on Resistance
vs Junction Temperature



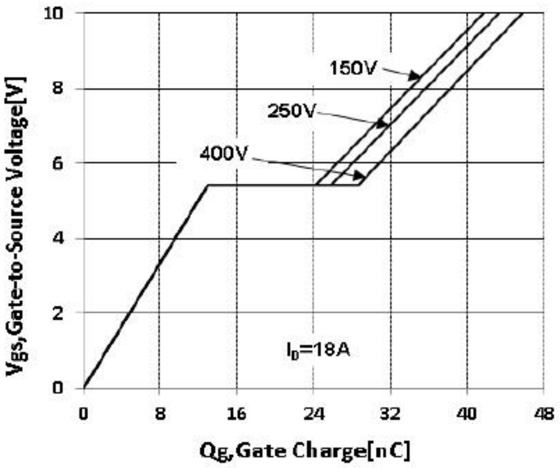
Typical Theshold Voltage vs Junction Temperature



Typical Breakdown Voltage vs Junction Temperature

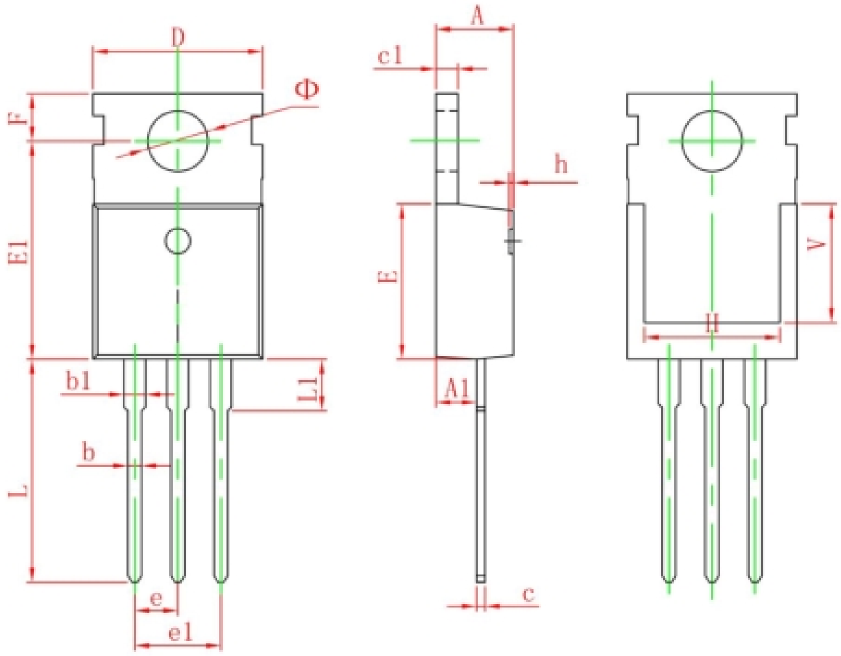


Typical Capacitance vs Drain to Source Voltage



Typical Gate Charge vs Gate to Source Voltage

TO-220-3L-C Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	**Max.**	**Min.**	**Max.**
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150