

50V N-Channel Mosfet

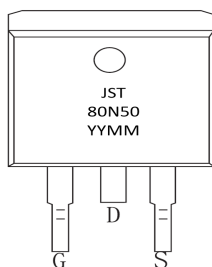
FEATURES

- $R_{DS(ON)}=5.0m\Omega(Typ.) @V_{GS}=10V$
- $R_{DS(ON)}=5.8m\Omega(Typ.) @V_{GS}=4.5V$

APPLICATIONS

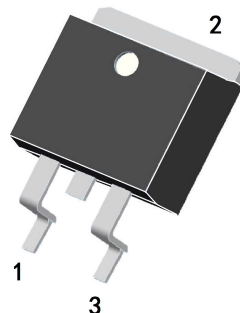
- PWM Applications
- Load Switch
- Power Management

MARKING



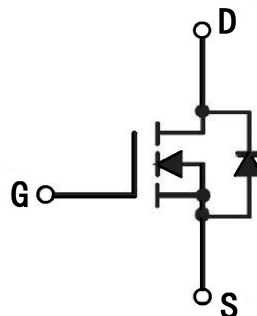
YYMM:Date Code(year & month)

TO-263-2L



- 1.Gate
- 2.Drain
- 3.Source

N-CHANNEL MOSFET



Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	100	A
Drain Current-Continuous($T_C=100^{\circ}C$)	$I_D(100^{\circ}C)$	70	A
Pulsed Drain Current	I_{DM}	400	A
Maximum Power Dissipation	P_D	100	W
Single pulse avalanche energy (Note 5)	E_{AS}	400	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^{\circ}C$
Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta JC}$	1.25	$^{\circ}C/W$

Electrical Characteristics (T_C=25°C unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	50	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =50V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	5.0	6.2	mΩ
		V _{GS} =4.5V, I _D =15A		5.8	7.8	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =20A	-	20	-	S
Dynamic Characteristics ^(Note4)						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V , F=1.0MHz	-	3600	-	PF
Output Capacitance	C _{oss}		-	340	-	PF
Reverse Transfer Capacitance	C _{rss}		-	230	-	PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =25V, R _L =1Ω V _{GS} =10V, R _G =3Ω	-	12	-	nS
Turn-on Rise Time	t _r		-	30	-	nS
Turn-Off Delay Time	t _{d(off)}		-	45	-	nS
Turn-Off Fall Time	t _f		-	31	-	nS
Total Gate Charge	Q _g	V _{DS} =25V, I _D =20A , V _{GS} =10V	-	65		nC
Gate-Source Charge	Q _{gs}		-	13		nC
Gate-Drain Charge	Q _{gd}		-	20		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V, I _S =20A	-		1.2	V
Diode Forward Current ^(Note 2)	I _S		-		100	A
Reverse Recovery Time	t _{rr}	TJ=25°C IF = 20A	-	36	-	nS
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs ^(Note3)	-	48	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Surface Mounted on FR4 Board, t ≤ 10 sec.

3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

4. Guaranteed by design, not subject to production

5. EAS condition : T_J=25°C, V_{DD}=25V, V_G=10V, L=0.5mH, R_G=25Ω

Typical Performance Characteristics

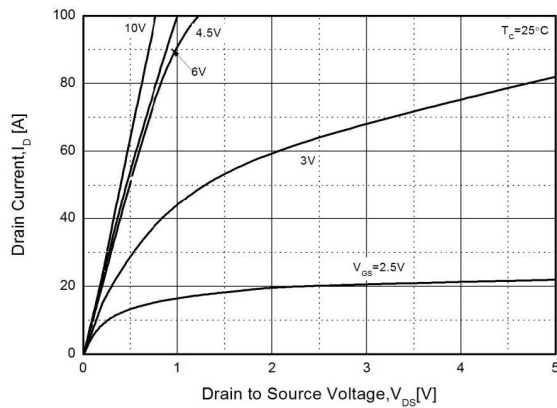


Figure1. Output Characteristics

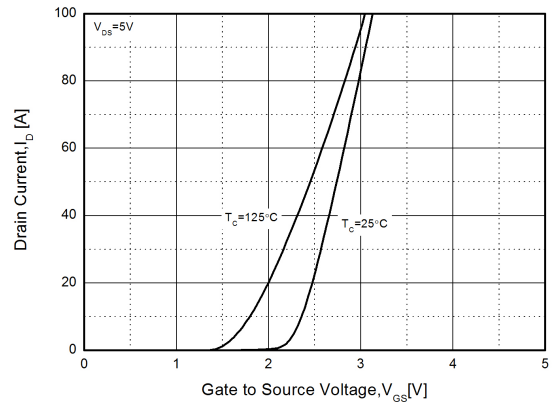


Figure2. Transfer Characteristics

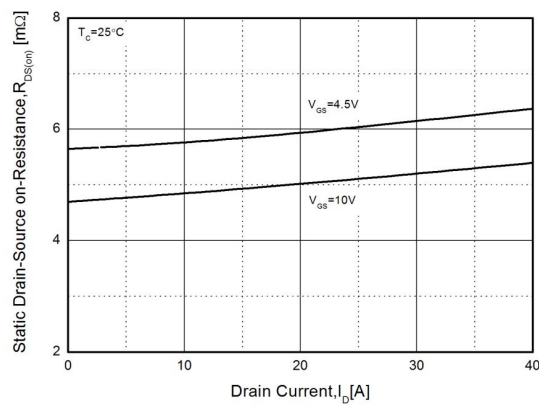


Figure3. Rdson-Drain Current

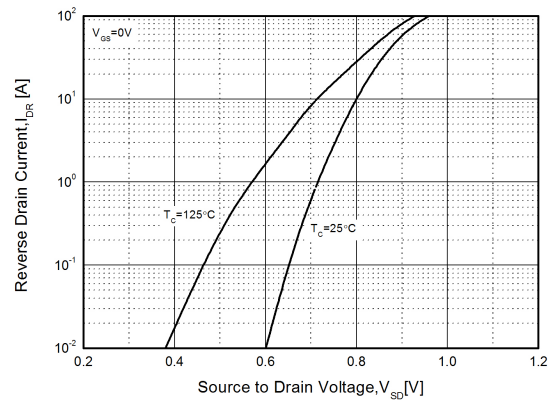


Figure4. Typical Source-Drain Diode Forward Voltage

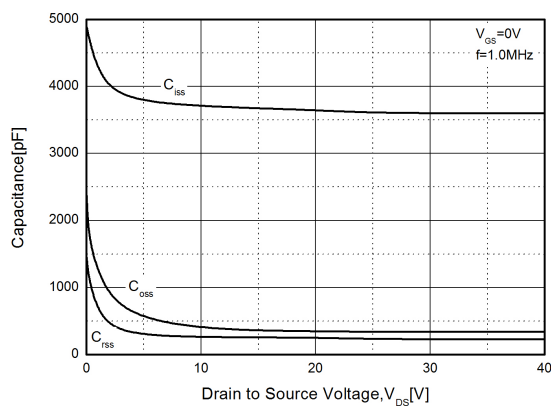


Figure5. Capacitance Characteristics

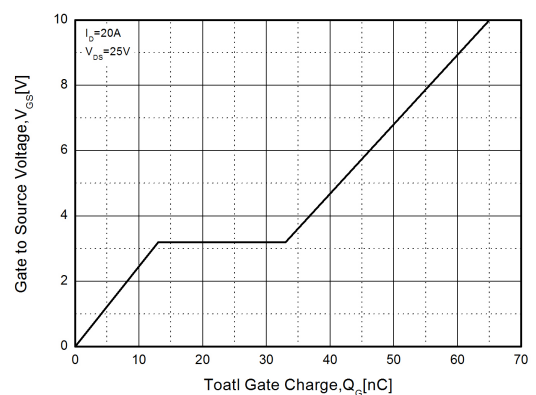


Figure6. Gate Charge

Typical Performance Characteristics (cont.)

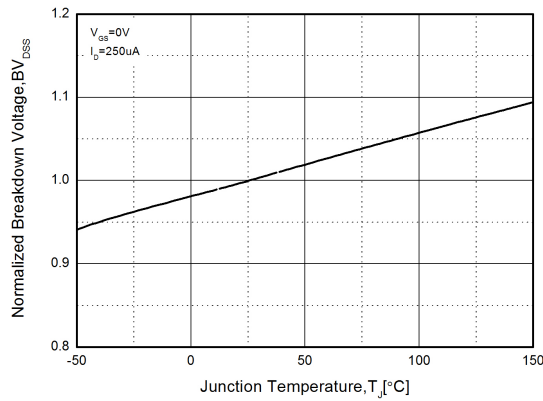


Figure7. Normalized Breakdown Voltage vs. Temperature

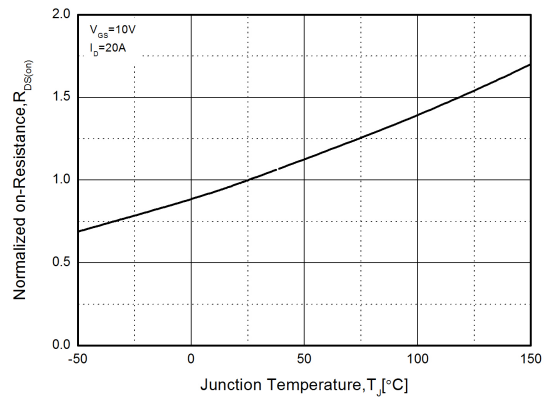


Figure8. Normalized on Resistance vs. Temperature

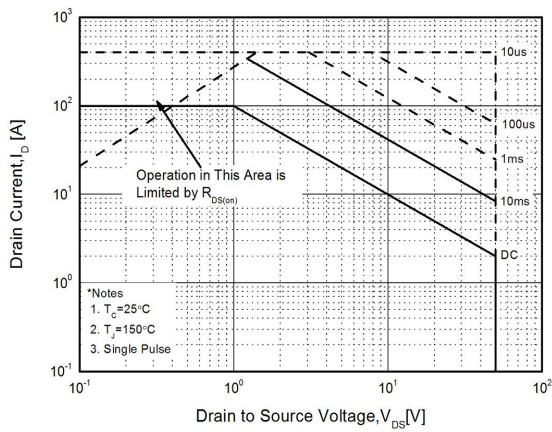


Figure9. Safe Operation Area

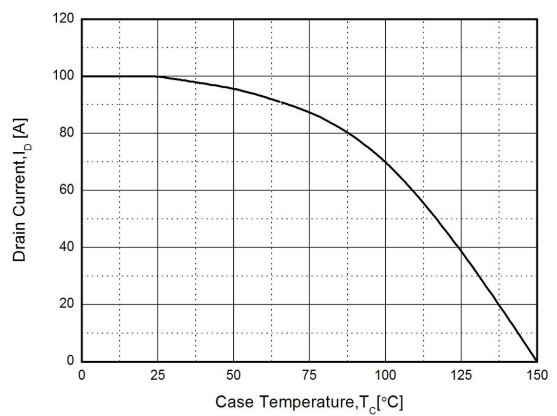


Figure10. Drain Current vs. Case Temperature

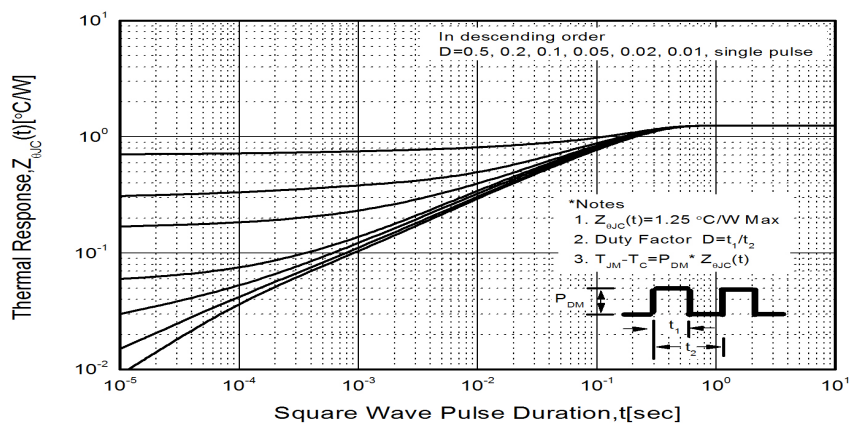
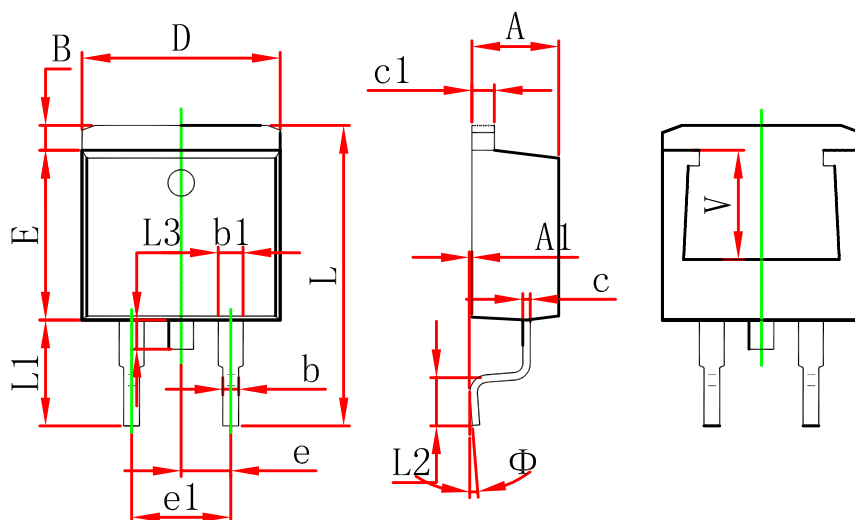


Figure11. Transient Thermal Response Curve

TO-263-2L PACKAGE OUTLINE DIMENSIONS



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.		0.220REF.	