PDFN 3x3 Plastic-Encapsulate MOSFETS

7506

N-Channel Enhancement Mode Power MOSFET

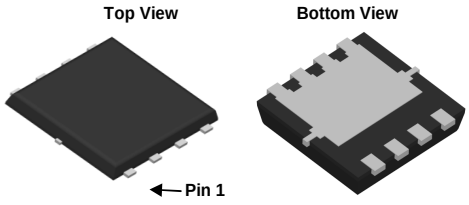
Features

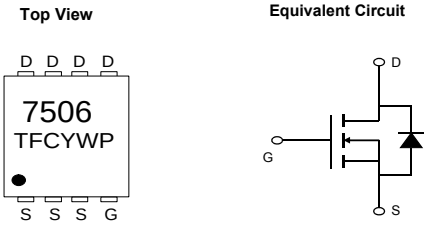
- 30V/30A,
  $R_{DS(ON)}$ =10mΩ(Typ.)@V_{GS}=10V
  $R_{DS(ON)}$ =15mΩ(Typ.)@V_{GS}=4.5V
- Super High Dense Cell Design
- Fast Switching Speed
- Low gate Charge
- 100% avalanche tested
- Lead Free and Green Devices Available

Applications

- Switching Application Systems

DFN 3x3_EP





Y :year code W :week code

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C=25°C	30	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	120	A
I_D ②	Continuous Drain Current@T_C(V_{GS}=10V)	T_C=25°C	30	A
	Continuous Drain Current@T_A(V_{GS}=10V) ③	T_A=25°C	10.8	
P_D	Maximum Power Dissipation@T_C	T_C=25°C	29	W
	Maximum Power Dissipation@T_A ③	T_A=25°C	3.5	

Notes:

①Pulse width limited by safe operating area.
②Calculated continuous current based on maximum allowable junction temperature.
③When mounted on 1 inch square copper board, t≤10sec.
④Limited by T_{Jmax}, I_{AS} =13A, V_{DD} = 24V, R_G = 50Ω, Starting T_J = 25°C.
⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.
⑥Guaranteed by design, not subject to production testing.

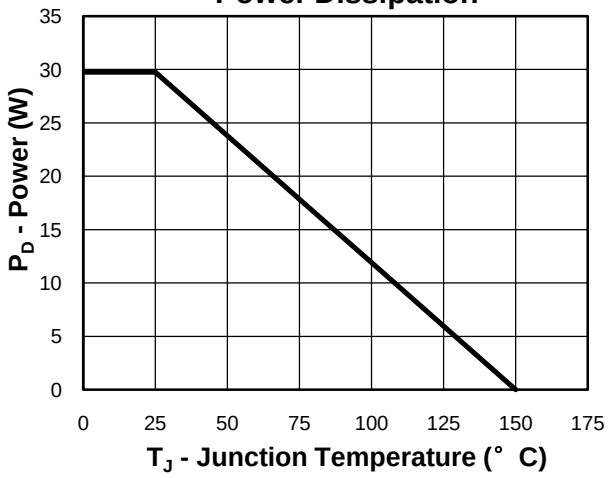
Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	4.2	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient	35	°C/W
Drain-Source Avalanche Ratings			
E_{AS} ④	Avalanche Energy, Single Pulsed	42	mJ

Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

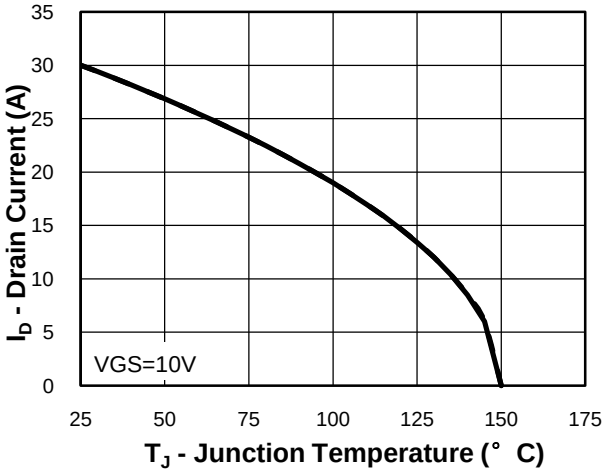
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.2	1.5	2.2	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=20A		10	14	mΩ
		V_{GS}=4.5V, I_{DS}=16A		15	23	mΩ
Diode Characteristics						
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=20A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=20A, dI_{SD}/dt=100A/μs		15		ns
Q_{rr}	Reverse Recovery Charge			8		nC
Dynamic Characteristics ⑥						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz		938		pF
C_{oss}	Output Capacitance			142		
C_{rss}	Reverse Transfer Capacitance			99		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=0.75Ω, I_{DS}=20A, V_{GEN}=10V, R_G=3Ω		5		ns
t_r	Turn-on Rise Time			12		
$t_{d(OFF)}$	Turn-off Delay Time			19		
t_f	Turn-off Fall Time			6		
Gate Charge Characteristics ⑥						
Q_g	Total Gate Charge	V_{DS}=24V, V_{GS}=10V, I_{DS}=20A		17.5		nC
Q_{gs}	Gate-Source Charge			3		
Q_{gd}	Gate-Drain Charge			4.1		

Typical Characteristics

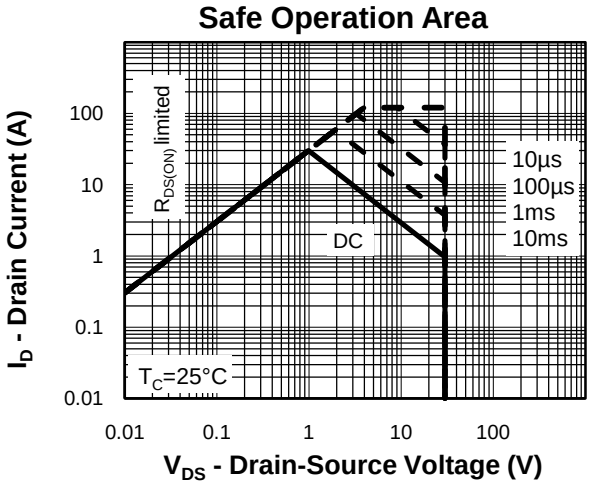
Power Dissipation



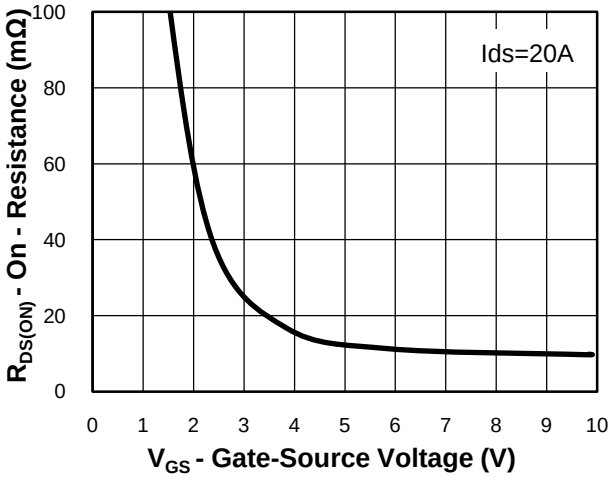
Drain Current



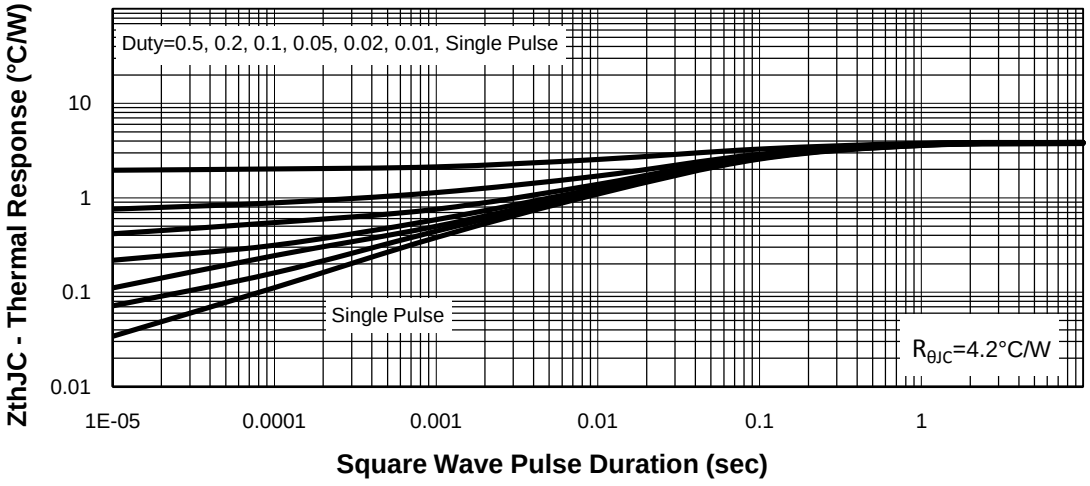
Safe Operation Area



Drain Current

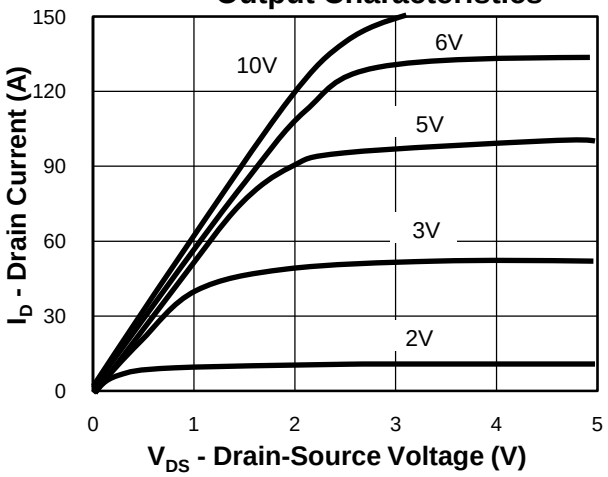


Thermal Transient Impedance

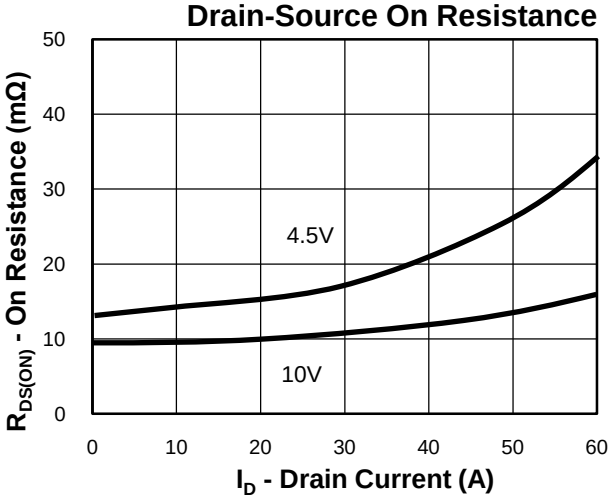


Typical Characteristics

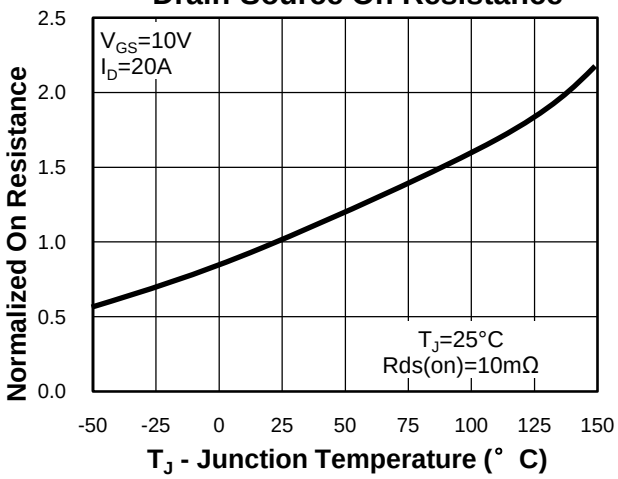
Output Characteristics



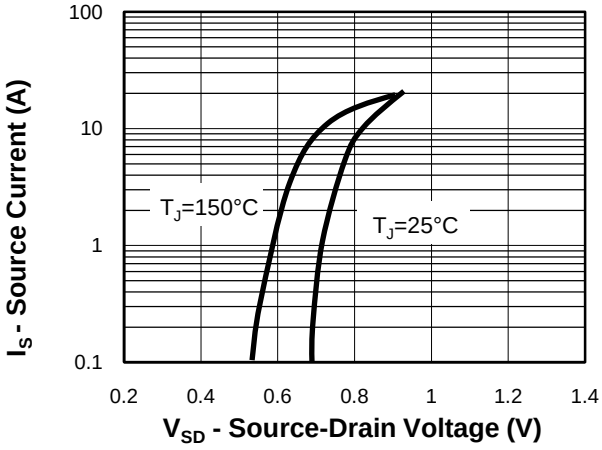
Drain-Source On Resistance



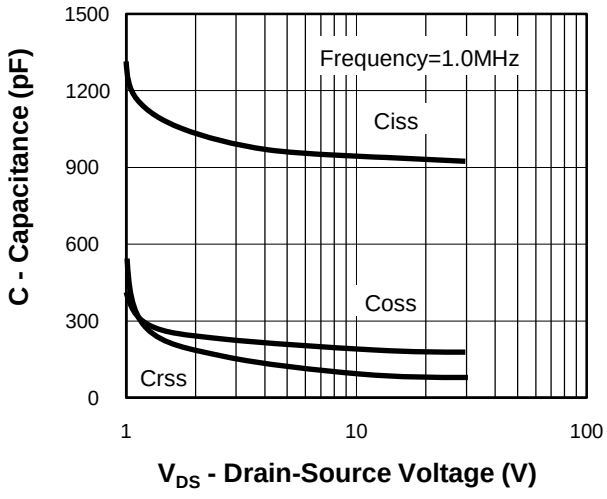
Drain-Source On Resistance



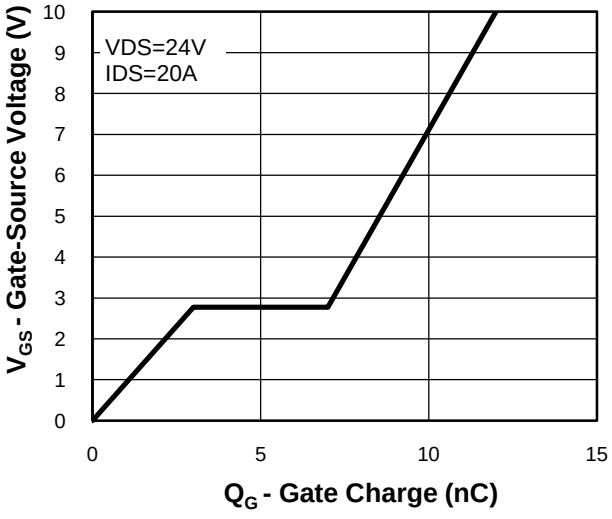
Source-Drain Diode Forward



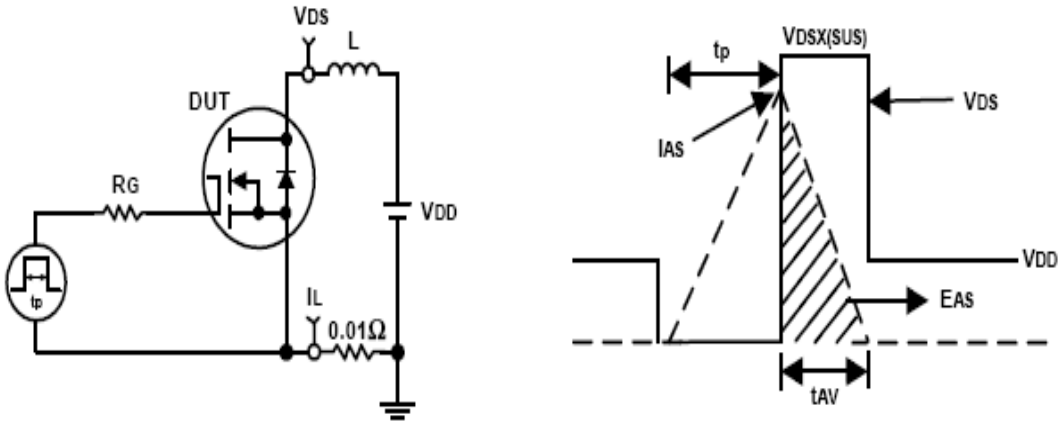
Capacitance



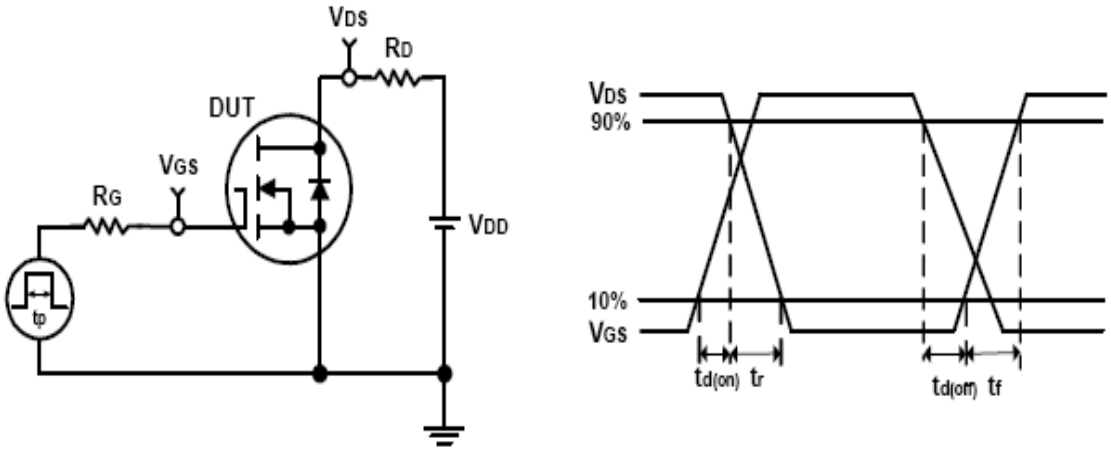
Gate Charge



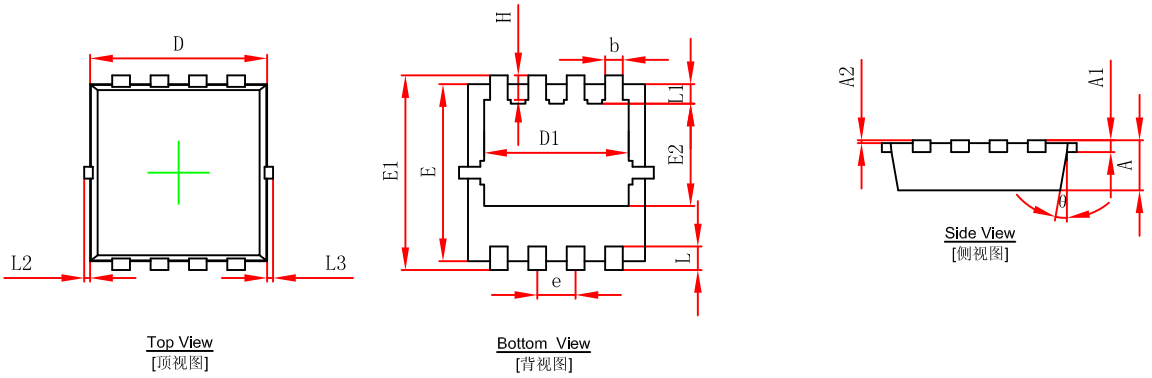
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

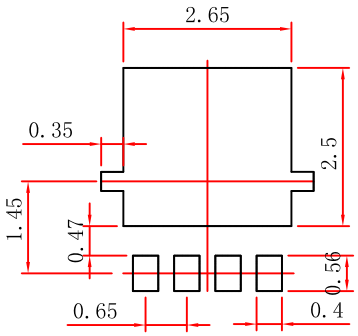


PDFNWB3.3x3.3-8L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

PDFNWB3.3x3.3-8L Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.