

XPN20L50

P-Channel Enhancement Mode MOSFET

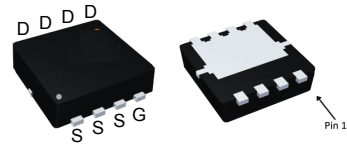
Features

- -20V/-50A,
 $R_{DS(ON)} = 13m\Omega(max.) @ V_{GS} = -4.5V$
 $R_{DS(ON)} = 16m\Omega(max.) @ V_{GS} = -2.5V$
 $R_{DS(ON)} = 25m\Omega(max.) @ V_{GS} = -1.8V$
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

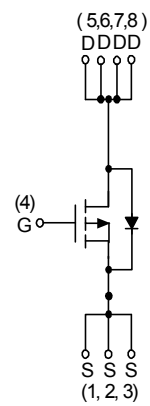
Applications

- Portable Equipment and Battery Powered Systems.

Pin Description



DFN3.3x3.3A-8_EP



P-Channel MOSFET

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Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		± 12	
I_D^a	Continuous Drain Current ($V_{GS} = -4.5\text{V}$)	$T_A = 25^\circ\text{C}$	-11	A
		$T_A = 70^\circ\text{C}$	-8.8	
I_{DM}^a	Pulsed Drain Current ($V_{GS} = -4.5\text{V}$)		-44 *	
I_D^c	Continuous Drain Current	$T_C = 25^\circ\text{C}$	-50	
		$T_C = 100^\circ\text{C}$	-22	
I_S^a	Diode Continuous Forward Current		-10	
T_J	Maximum Junction Temperature		150	$^\circ\text{C}$
I_{AS}^d	Avalanche Current, Single pulse	$L = 0.5\text{mH}$	-12	A
E_{AS}^d	Avalanche Energy, Single pulse	$L = 0.5\text{mH}$	36	mJ
T_{STG}	Storage Temperature Range		-55 to 150	$^\circ\text{C}$
P_D^a	Maximum Power Dissipation	$T_A = 25^\circ\text{C}$	3.1	W
		$T_A = 70^\circ\text{C}$	2	
P_D^c	Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	31.25	
		$T_C = 100^\circ\text{C}$	12.5	
$R_{\theta JA}^{a,b}$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	40	$^\circ\text{C/W}$
		Steady State	80	
$R_{\theta JC}^c$	Thermal Resistance-Junction to Case		4	$^\circ\text{C/W}$

Note * : Package limited.

Note a : Surface Mounted on 1in^2 pad area, $t \leq 10\text{sec}$.

Note b : Maximum under Steady State conditions is 75°C/W .

Note c : The power dissipation P_D is based on $T_{J(MAX)} = 150^\circ\text{C}$, and it is useful for reducing junction-to-case thermal resistance ($R_{\theta JC}$) when additional heat sink is used.

Note d : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$).

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-16V, V _{GS} =0V T _J =85°C	-	-	-1 -30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.5	-	-1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±10	μA
R _{DS(ON)} ^e	Drain-Source On-state Resistance	V _{GS} =-4.5V, I _{DS} =-11A V _{GS} =-2.5V, I _{DS} =-6A V _{GS} =-1.8V, I _{DS} =-1A	- - -	10 13 20	13 16 25	mΩ
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.7	-1	V
t _{rr} ^f	Reverse Recovery Time	I _{SD} =-11A, dI _{SD} /dt=100A/μs	-	63	-	ns
Q _{rr} ^f	Reverse Recovery Charge		-	54	-	nC
Dynamic Characteristics ^f						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, Frequency=1.0MHz	-	1620	-	pF
C _{oss}	Output Capacitance		-	320	-	
C _{rss}	Reverse Transfer Capacitance		-	290	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-10V, R _L =10Ω, I _{DS} =-1A, V _{GEN} =-4.5V, R _G =6Ω	-	9	-	ns
t _r	Turn-on Rise Time		-	13	-	
t _{d(OFF)}	Turn-off Delay Time		-	26	-	
t _f	Turn-off Fall Time		-	167	-	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V, I _{DS} =-11A	-	25	-	nC
Q _{gs}	Gate-Source Charge		-	1.6	-	
Q _{gd}	Gate-Drain Charge		-	11	-	

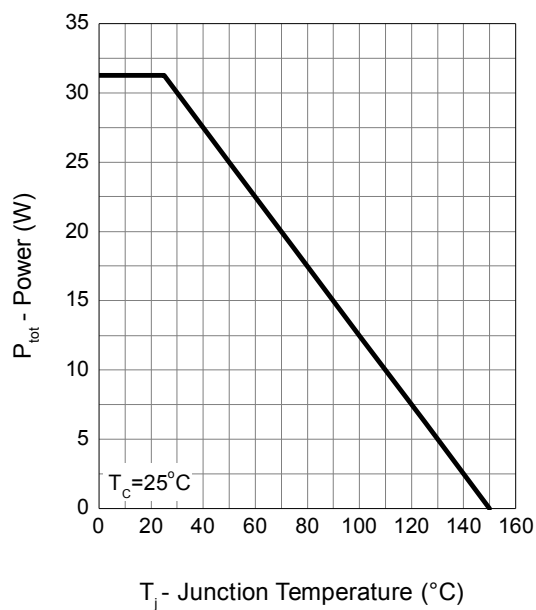
Note e : Pulse test; pulse width≤300μs, duty cycle≤2%.

Note f : Guaranteed by design, not subject to production testing.

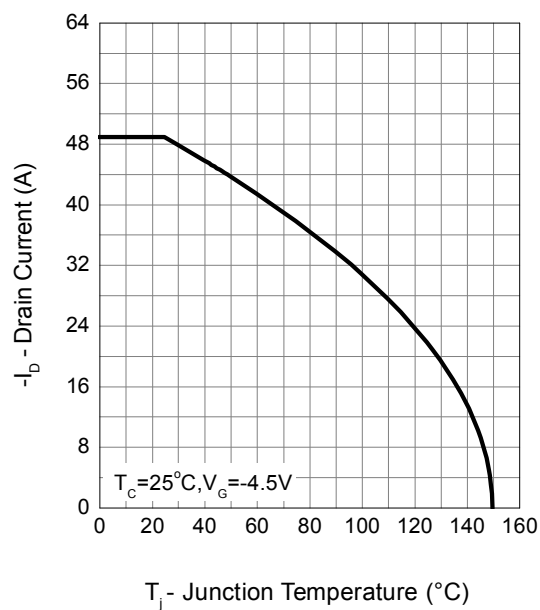
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Typical Operating Characteristics

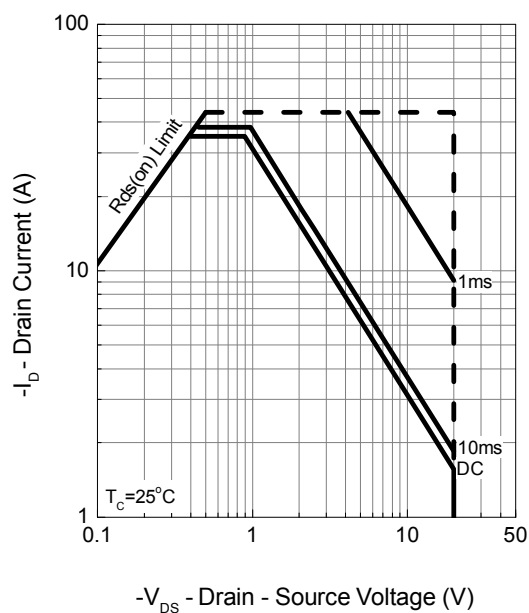
Power Dissipation



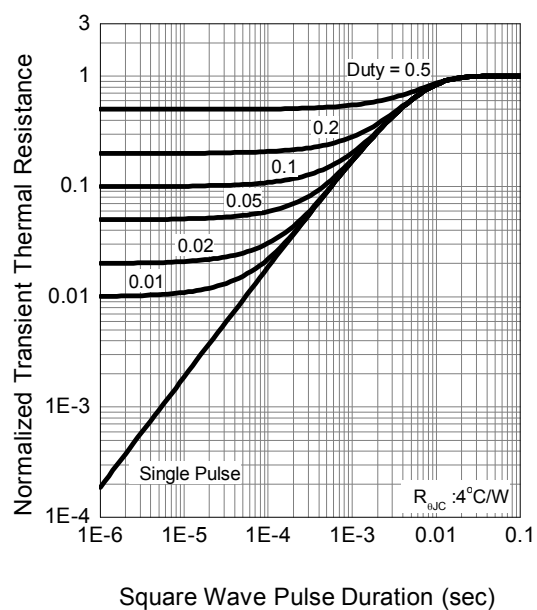
Drain Current



Safe Operation Area

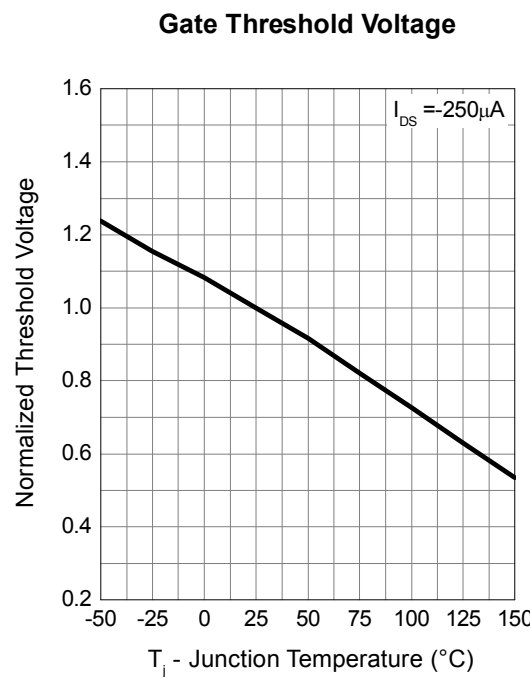
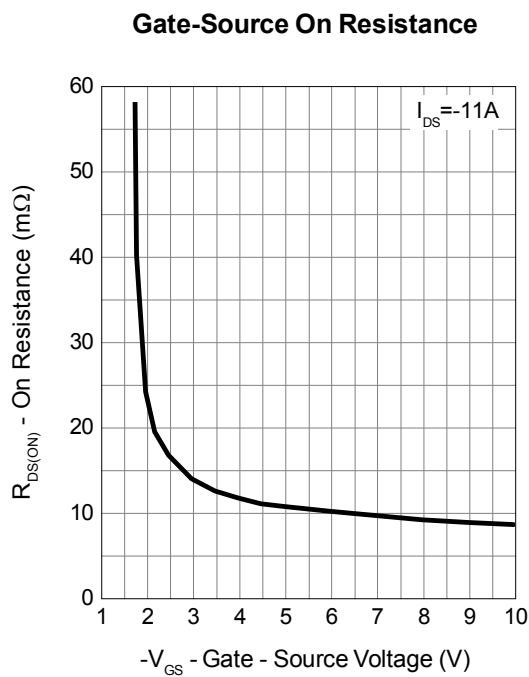
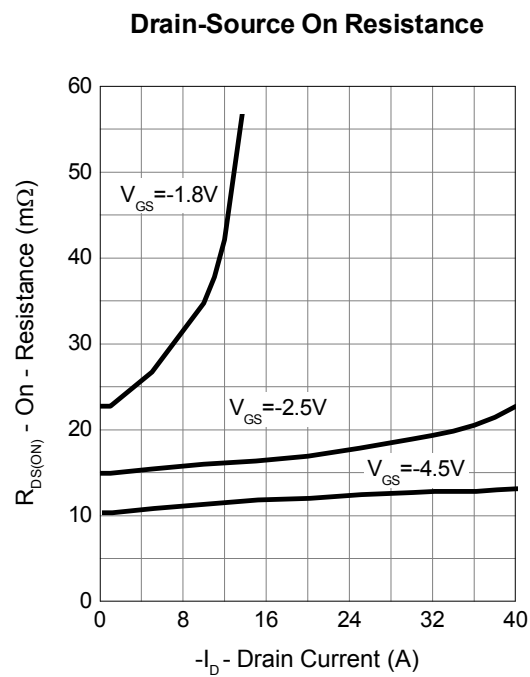
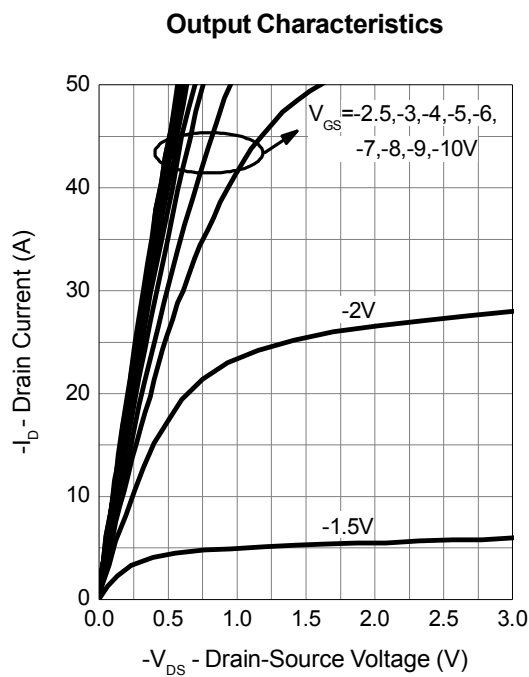


Thermal Transient Impedance



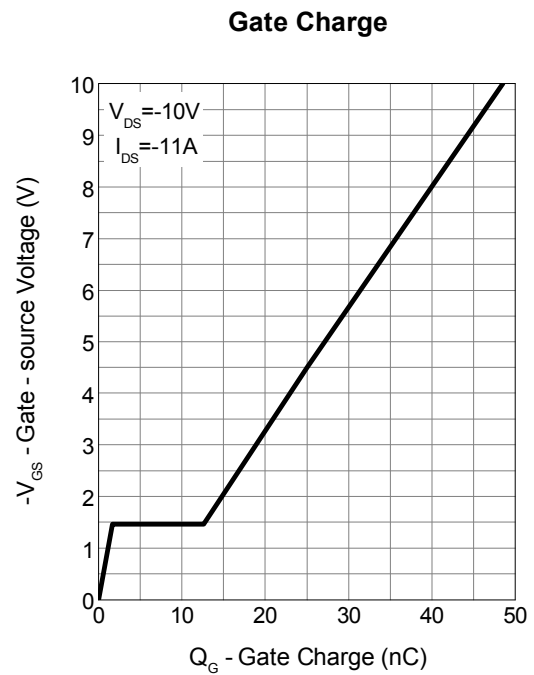
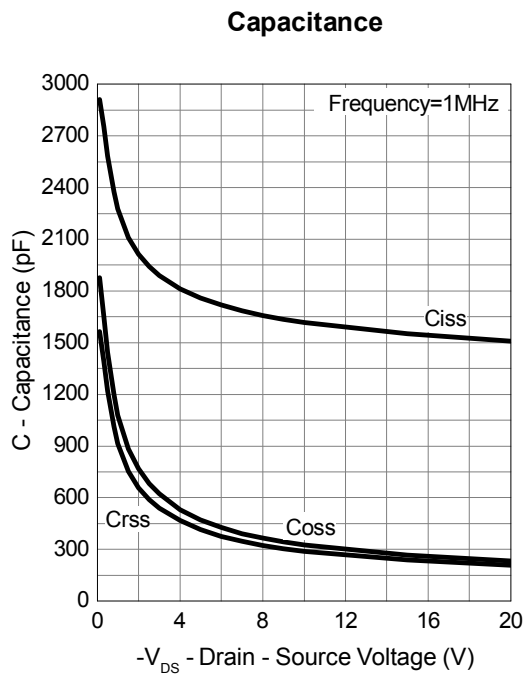
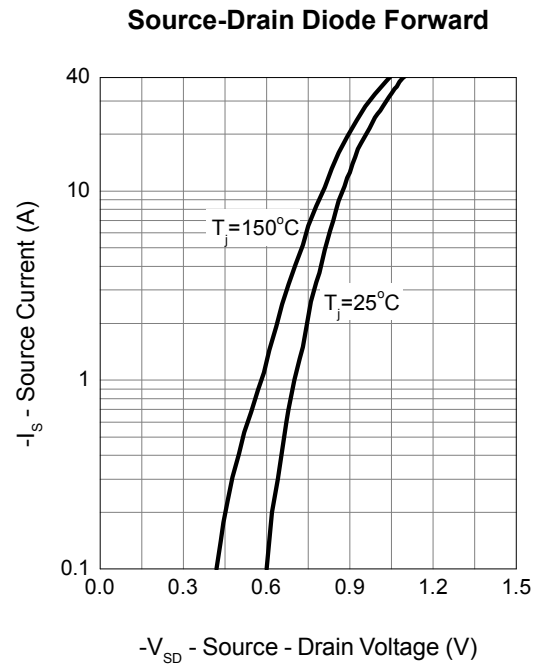
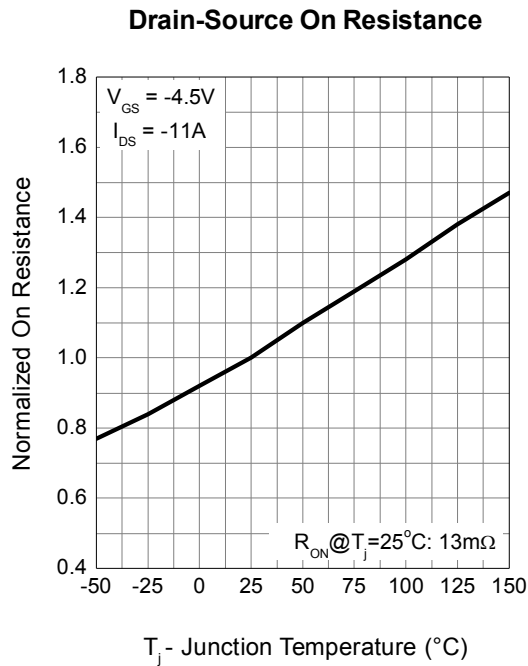
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Typical Operating Characteristics (Cont.)

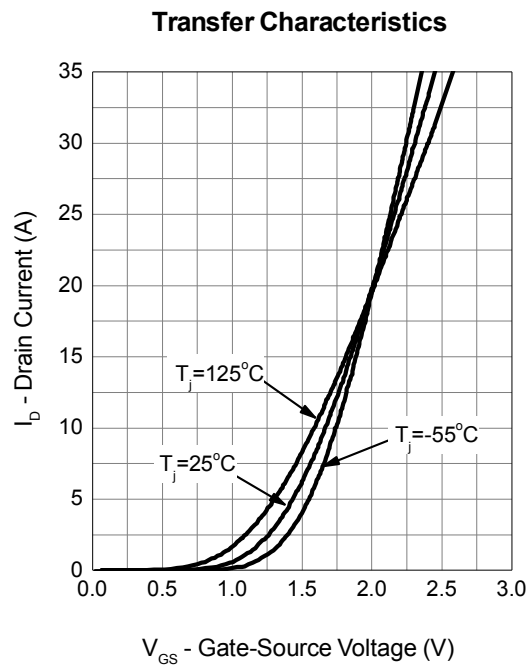


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Typical Operating Characteristics (Cont.)



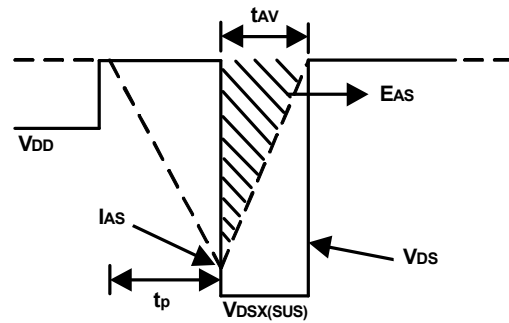
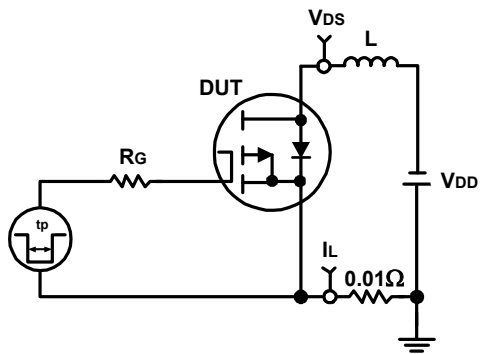
Typical Operating Characteristics (Cont.)



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Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

