

# LP4411ET1G

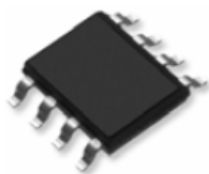
## P-Channel Enhancement Mode Field Effect Transistor Features

$$V_{DS} (V) = -30V$$

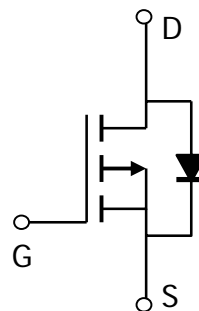
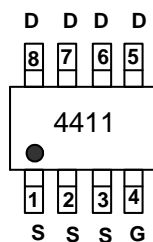
$$I_D = -8 A (V_{GS} = -10V)$$

$$R_{DS(ON)} < 32m\Omega (V_{GS} = -10V)$$

$$R_{DS(ON)} < 55m\Omega (V_{GS} = -4.5V)$$



SOP-8 top view



Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted			
Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>A</sup>	$I_D$	$T_A=25^\circ\text{C}$	-8
		$T_A=70^\circ\text{C}$	-6.6
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	-40	A
Power Dissipation <sup>A</sup>	$P_D$	$T_A=25^\circ\text{C}$	3
		$T_A=70^\circ\text{C}$	2.1
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

Thermal Characteristics					
Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$t \leq 10s$	$R_{\theta JA}$	24	40	$^\circ\text{C/W}$
Maximum Junction-to-Ambient <sup>A</sup>	Steady-State		54	75	$^\circ\text{C/W}$
Maximum Junction-to-Lead <sup>C</sup>	Steady-State	$R_{\theta JL}$	21	30	$^\circ\text{C/W}$

Electrical Characteristics ( $T_J=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$I_D=-250\mu\text{A}$ , $V_{GS}=0\text{V}$	-30			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-24\text{V}$ , $V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$			-1	$\mu\text{A}$
					-5	
$I_{GSS}$	Gate-Body leakage current	$V_{DS}=0\text{V}$ , $V_{GS}=\pm 20\text{V}$			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ , $I_D=-250\mu\text{A}$	-1.2	-2	-2.4	V
$I_{D(ON)}$	On state drain current	$V_{GS}=-10\text{V}$ , $V_{DS}=-5\text{V}$	-40			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10\text{V}$ , $I_D=-8\text{A}$ $T_J=125^\circ\text{C}$		24.5	32	m $\Omega$
				33		
		$V_{GS}=-4.5\text{V}$ , $I_D=-5\text{A}$		41	55	m $\Omega$
$g_{FS}$	Forward Transconductance	$V_{DS}=-5\text{V}$ , $I_D=-8\text{A}$		14.5		S
$V_{SD}$	Diode Forward Voltage	$I_S=-1\text{A}$ , $V_{GS}=0\text{V}$		-0.76	-1	V
$I_S$	Maximum Body-Diode Continuous Current				-4.2	A
<b>DYNAMIC PARAMETERS</b>						
$C_{ISS}$	Input Capacitance	$V_{GS}=0\text{V}$ , $V_{DS}=-15\text{V}$ , $f=1\text{MHz}$		920	1120	pF
$C_{OSS}$	Output Capacitance			190		pF
$C_{RSS}$	Reverse Transfer Capacitance			122		pF
$R_g$	Gate resistance	$V_{GS}=0\text{V}$ , $V_{DS}=0\text{V}$ , $f=1\text{MHz}$		3.6	5	$\Omega$
<b>SWITCHING PARAMETERS</b>						
$Q_g(10\text{V})$	Total Gate Charge (10V)	$V_{GS}=-10\text{V}$ , $V_{DS}=-15\text{V}$ , $I_D=-8\text{A}$		18.4	23	nC
$Q_g(4.5\text{V})$	Total Gate Charge (4.5V)			9.3	11.5	nC
$Q_{gs}$	Gate Source Charge			2.7		nC
$Q_{gd}$	Gate Drain Charge			4.9		nC
$t_{D(on)}$	Turn-On DelayTime	$V_{GS}=-10\text{V}$ , $V_{DS}=-15\text{V}$ , $R_L=1.8\Omega$ , $R_{GEN}=3\Omega$		7.1		ns
$t_r$	Turn-On Rise Time			3.4		ns
$t_{D(off)}$	Turn-Off DelayTime			18.9		ns
$t_f$	Turn-Off Fall Time			8.4		ns
$t_{rr}$	Body Diode Reverse Recovery Time		$I_F=-8\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$		21.5	27
$Q_{rr}$	Body Diode Reverse Recovery Charge	$I_F=-8\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$		12.5		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

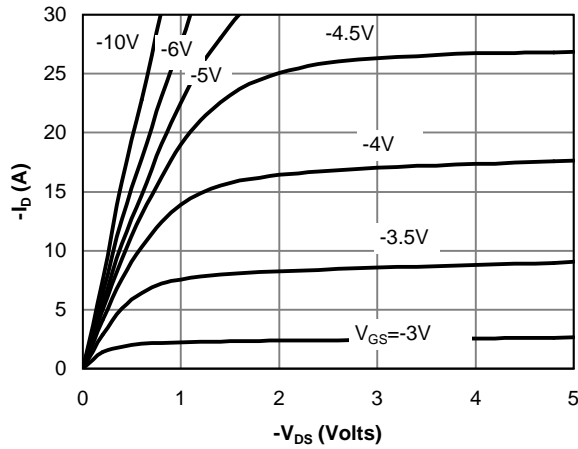


Fig 1: On-Region Characteristics

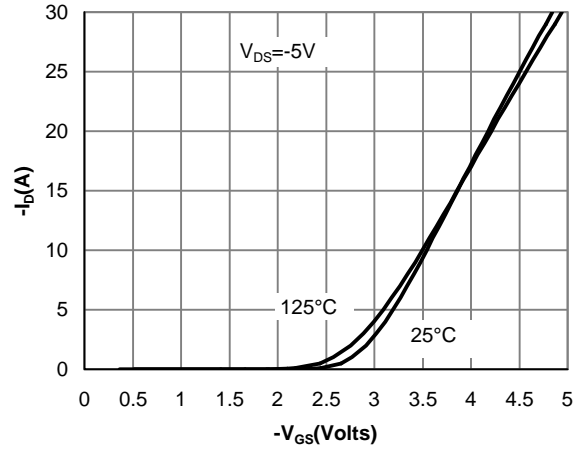


Figure 2: Transfer Characteristics

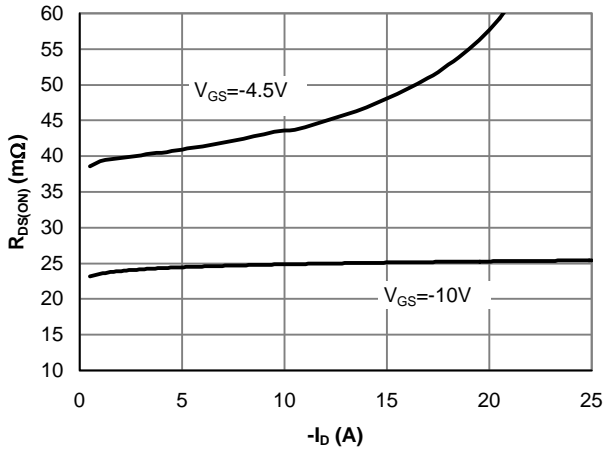


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

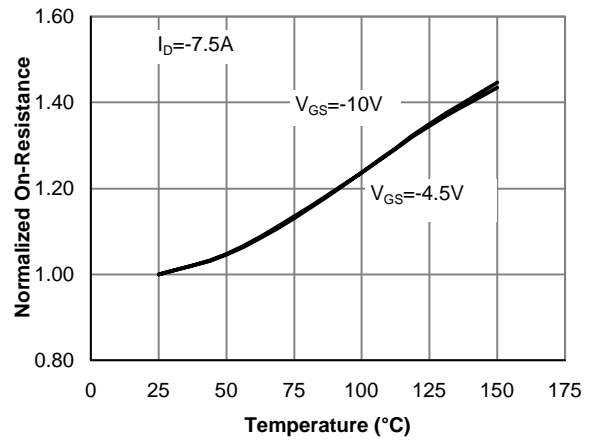


Figure 4: On-Resistance vs. Junction Temperature

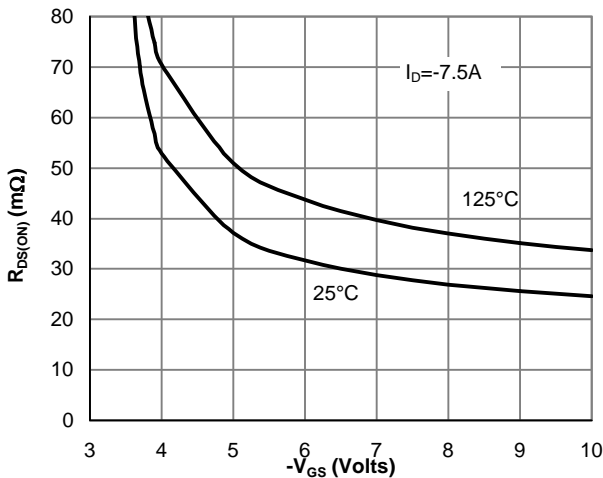


Figure 5: On-Resistance vs. Gate-Source Voltage

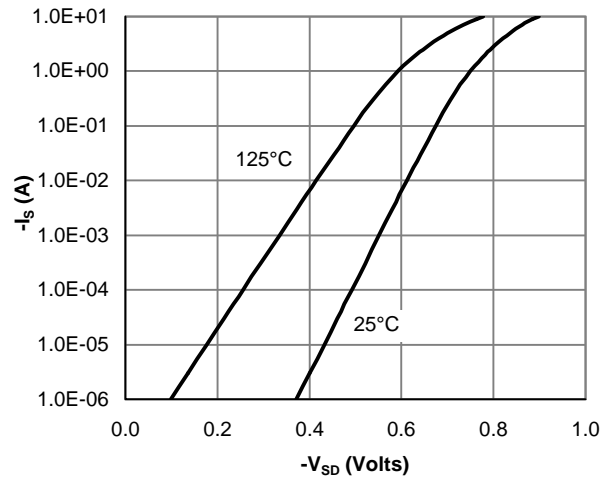


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

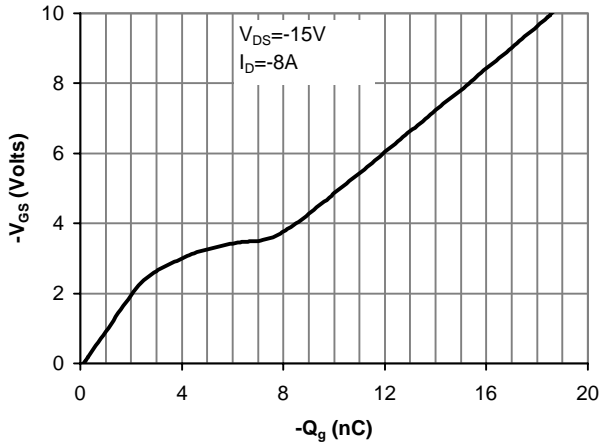


Figure 7: Gate-Charge Characteristics

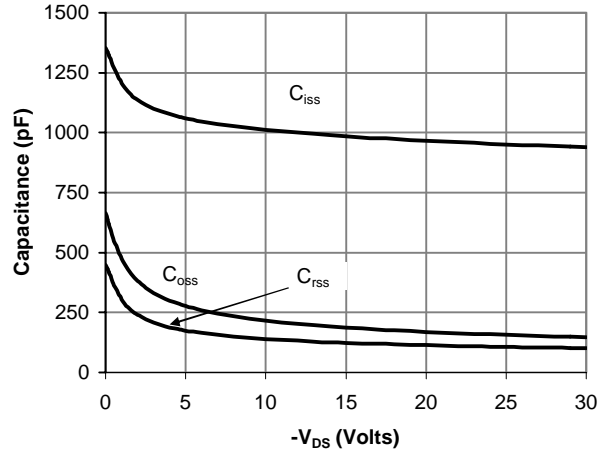


Figure 8: Capacitance Characteristics

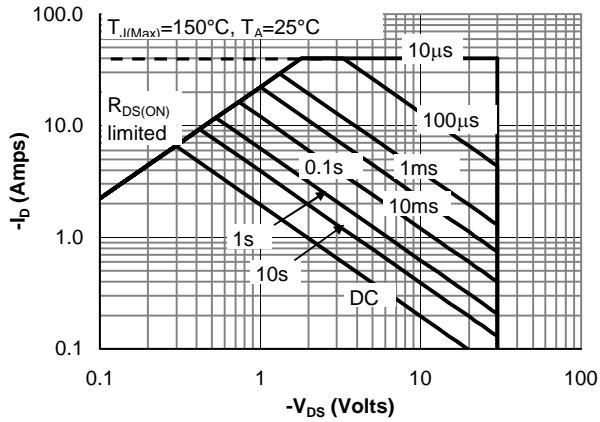


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

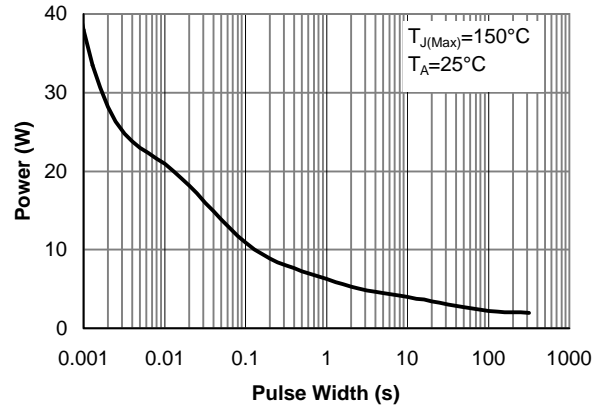


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

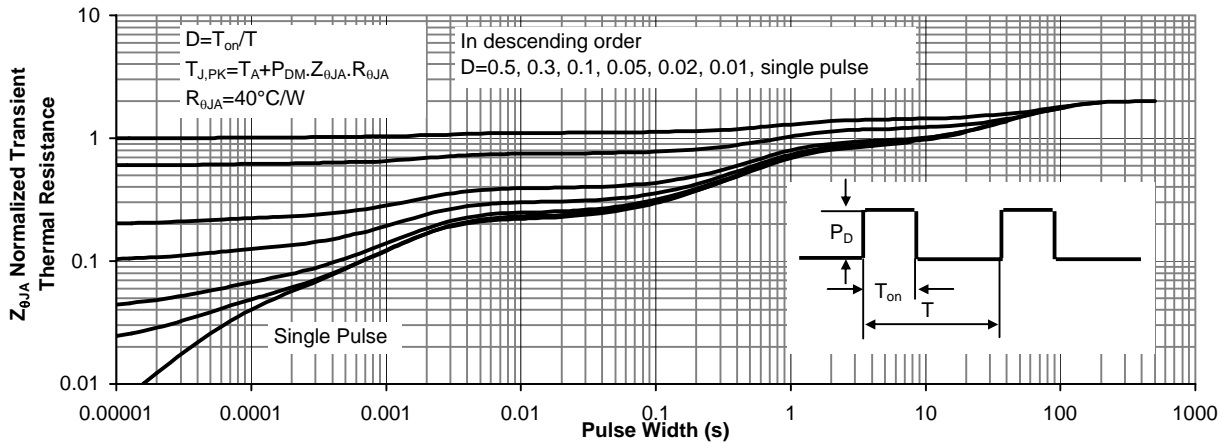


Figure 11: Normalized Maximum Transient Thermal Impedance

**SOP-8**
