



PJM6016NPA

Single N-Channel Power MOSFET

Features

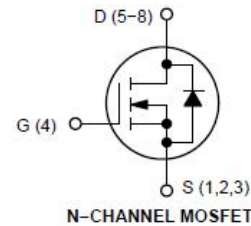
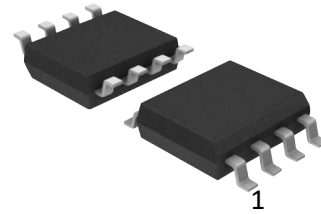
The PJM6016NPA uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge.

- Fast Switching
- Low Gate Charge and $R_{DS(ON)}$
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test
- $V_{DSS}=60V$
 $I_D=16A$
 $P_D=3W$
 $R_{DS(ON)} < 9m\Omega @ V_{GS}=10V$ (Typ $7.5m\Omega$)

Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

SOP-8



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

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	60	V
I_D	Continuous Drain Current	16	A
	Continuous Drain Current $T_C = 100^\circ C$	12	A
I_{DM}	Pulsed Drain Current	54	A
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}^{a2}	Single Pulse Avalanche Energy	90	mJ
E_{AR}^{a1}	Avalanche Energy ,Repetitive	20	mJ
I_{AR}^{a1}	Avalanche Current	10	A
dv/dt^{a3}	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	3.0	W
T_J, T_{stg}	Operating Junction and Storage	175, -55 to 175	$^\circ C$
T_L	Maximum Temperature for Soldering	300	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typ	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-Case	42	$^\circ C / W$



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

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
Off Characteristics						
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=60V, V_{GS}=0V, T_a=25^\circ\text{C}$	--	--	1.0	μA
		$V_{DS}=48V, V_{GS}=0V, T_a=125^\circ\text{C}$			250	
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=+20V$	--	--	1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=-20V$	--	--	-1	μA
On Characteristics						
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=16A$	--	7.5	9.0	m Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.3	2.0	V
Pulse width<380 μs ;duty cycle<2%.						
Dynamic Characteristics						
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=16A$	40	--	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=30V, f=1.0\text{MHz}$	--	4100	--	pF
C_{oss}	Output Capacitance		--	300	--	
C_{rss}	Reverse Transfer Capacitance		--	230	--	
Resistive Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	$I_D=16A, V_{DD}=30V$ $V_{GS}=10V, R_g=3.0\Omega$	--	10		ns
t_r	Rise Time		--	9		
$t_{d(OFF)}$	Turn-Off Delay Time		--	45		
t_f	Fall Time		--	18		
Q_g	Total Gate Charge	$I_D=16A, V_{DD}=30V, V_{GS}=10V$	--	100		nC
Q_{gs}	Gate to Source Charge		--	10	--	
Q_{gd}	Gate to Drain (" Miller ")Charge		--	22	--	
Source-Drain Diode Characteristics						
I_{SD}	Continuous Source Current (Body Diode)		--	--	14	A
V_{SD}	Diode Forward Voltage	$I_S=16A, V_{GS}=0V$	--	--	1.2	V
I_S	Continuous Source Current (Body Diode)		--	--	16	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	54	A
V_{SD}	Diode Forward Voltage	$I_S=16A, V_{GS}=0V$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S=16A, T_J=25^\circ\text{C}$	--	35	--	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu s, V_{GS}=0V$	--	48	--	nC
Pulse width<380 μs ;duty cycle<2%.						

a1: Repetitive Rating: Pulse width limited by maximum junction temperature.

a2: EAS condition: $T_J=25^\circ\text{C}, V_{DD}=30V, V_G=10V, L=0.5\text{mH}, R_g=25\Omega$

a3: $I_{SD}=16A, di/dt \leq 100A/\mu s, V_{DD} \leq BV_{DS}$, Start $T_J=25^\circ\text{C}$



Test Circuit and Waveform

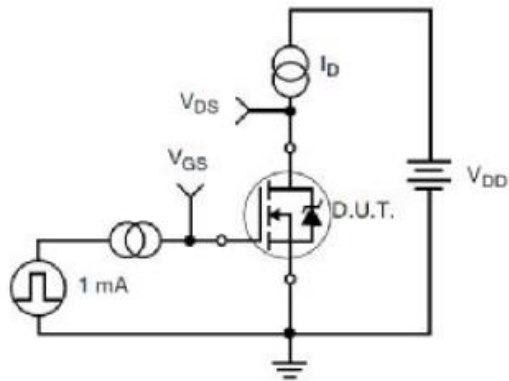


Figure 17. Gate Charge Test Circuit

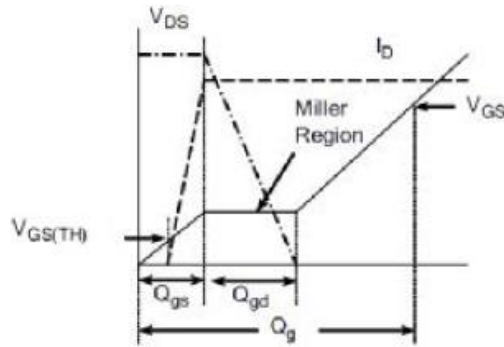


Figure 18. Gate Charge Waveform

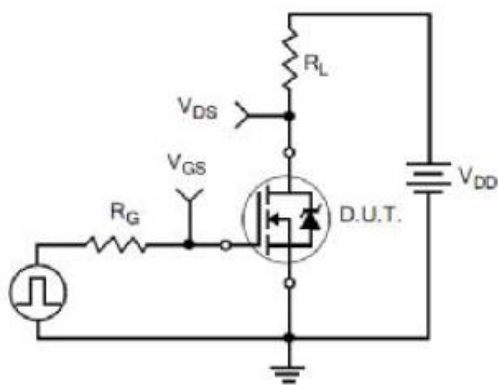


Figure 19. Resistive Switching Test Circuit

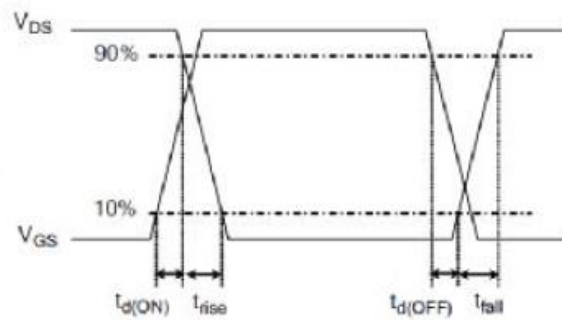


Figure 20. Resistive Switching Waveforms



Typical Characteristic Curves

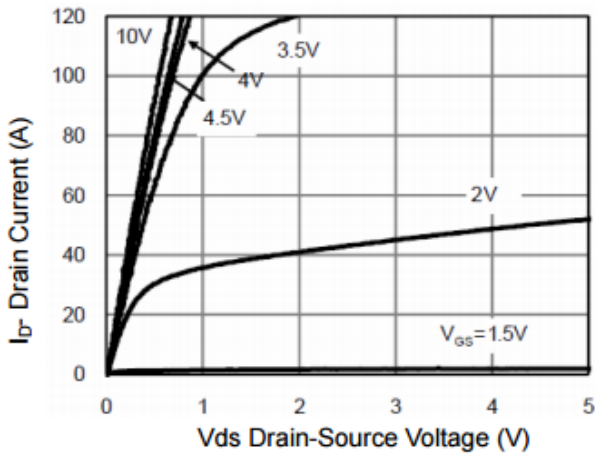


Figure 1 Output Characteristics

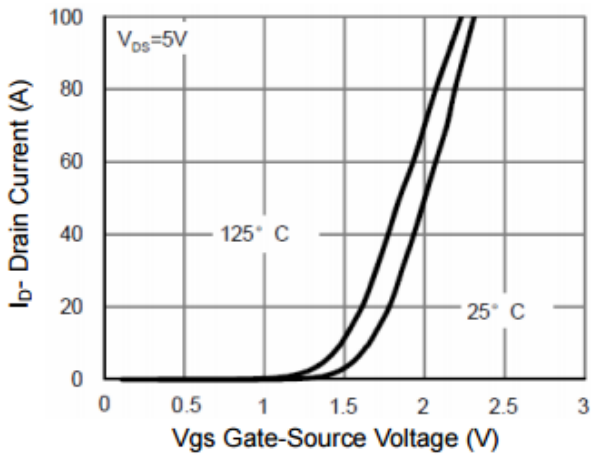


Figure 2 Transfer Characteristics

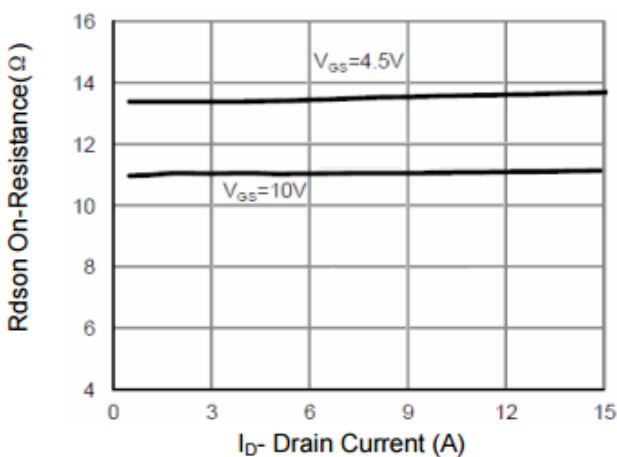


Figure 3 Rds(on) - Drain Current

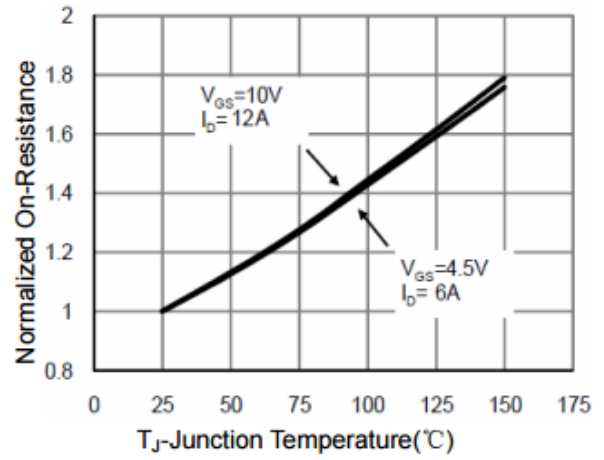


Figure 4 Rds(on) - Junction Temperature

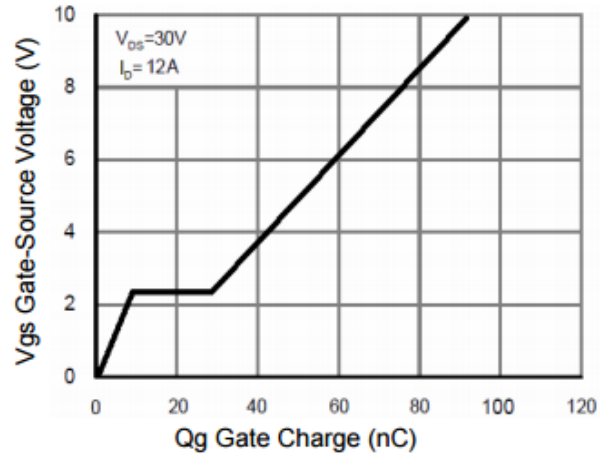


Figure 5 Gate Charge

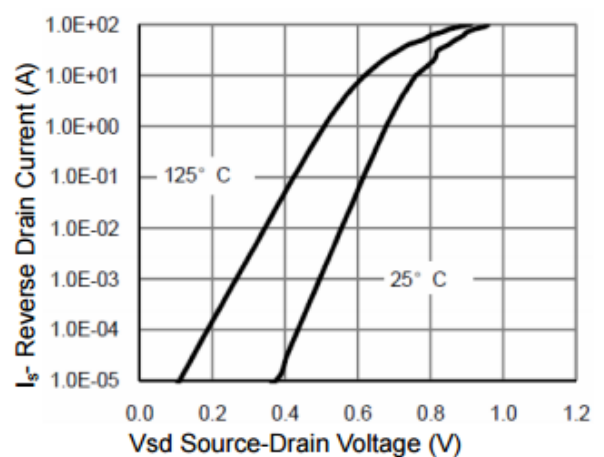


Figure 6 Source-Drain Diode Forward

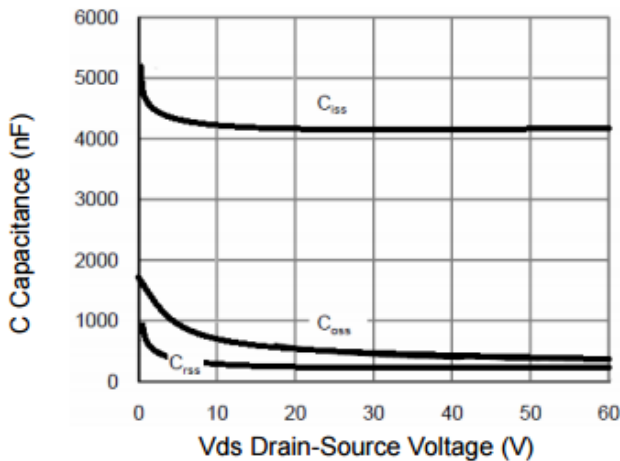


Figure 7 Capacitance vs Vds

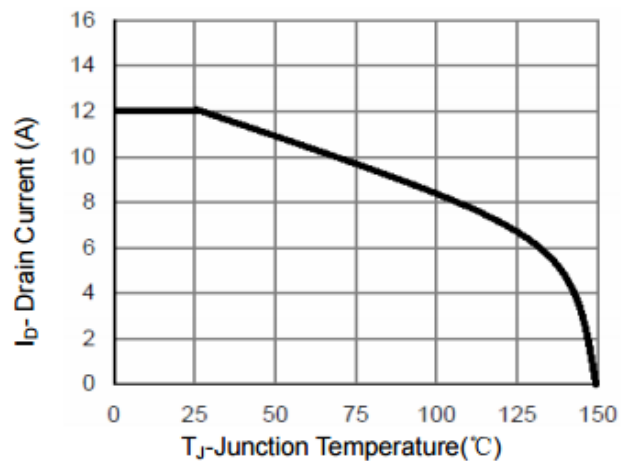


Figure 9 Current De-rating

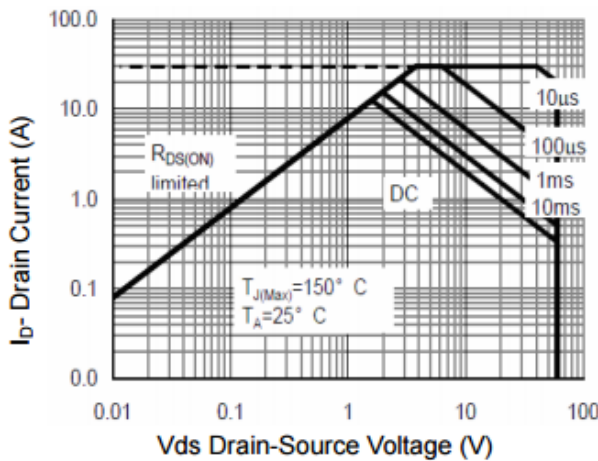


Figure 8 Safe Operation Area

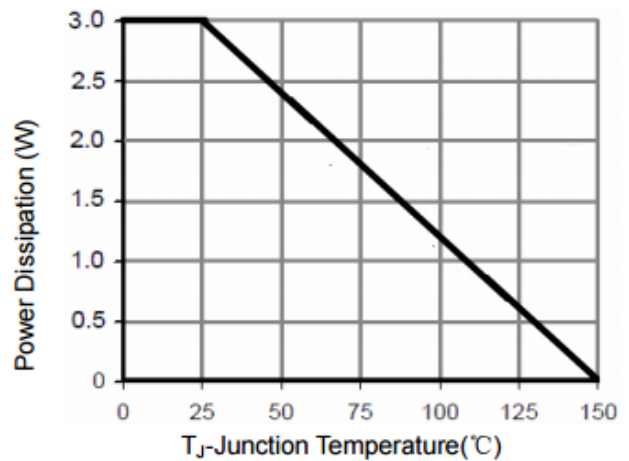


Figure 10 Power De-rating

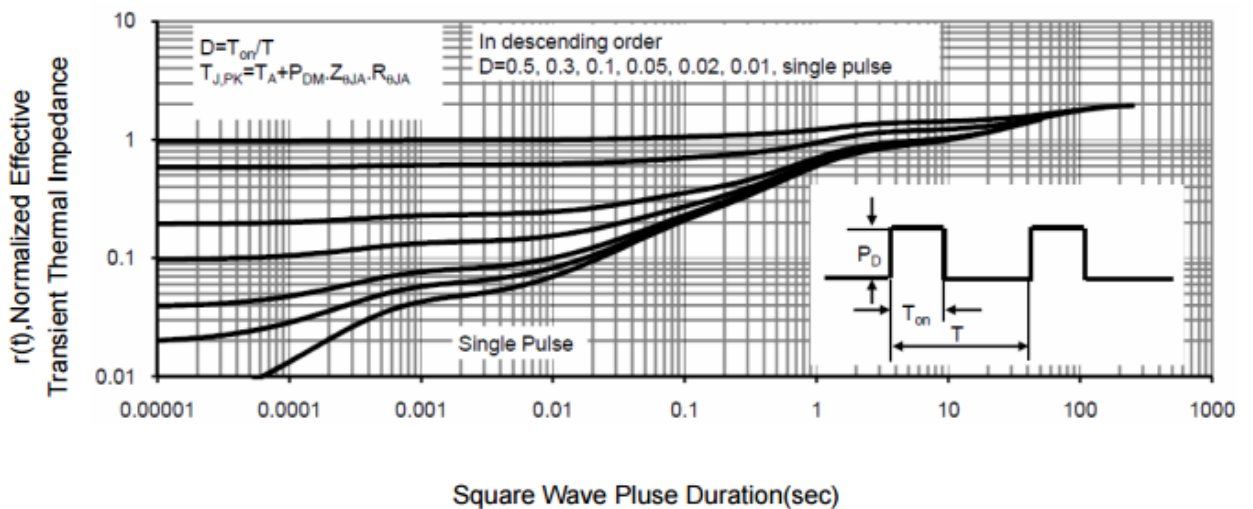


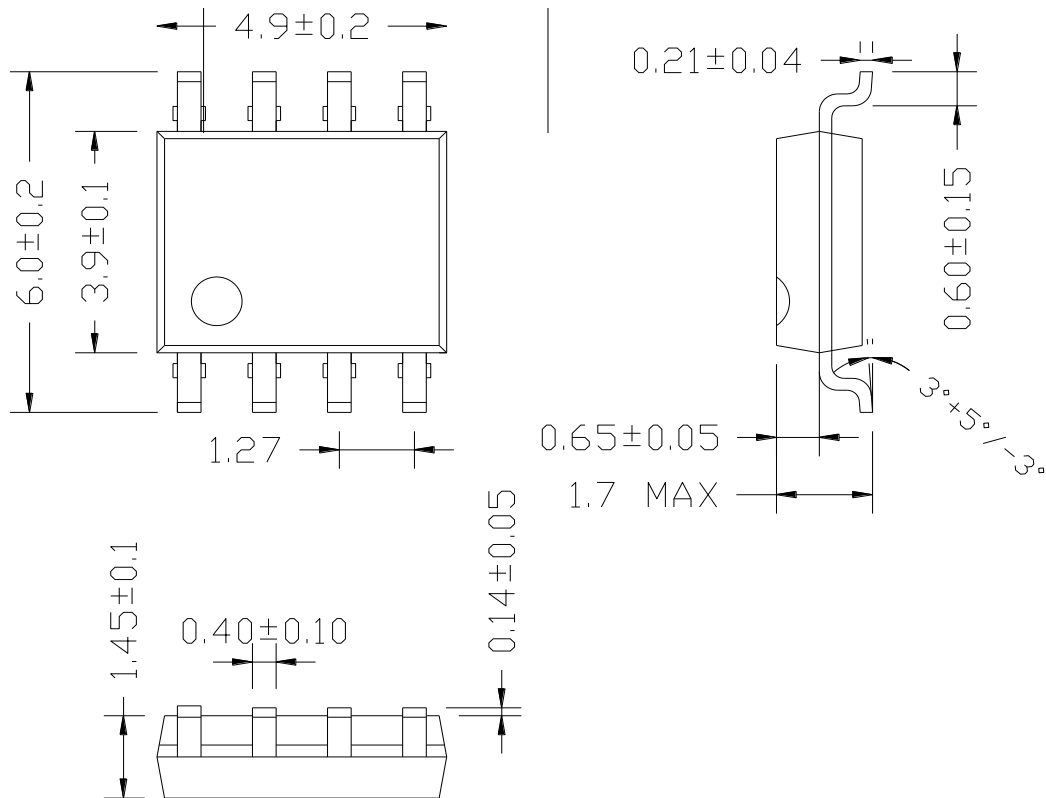
Figure 11 Normalized Maximum Transient Thermal Impedance



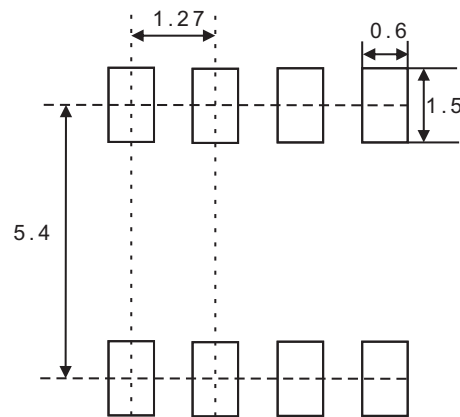
Package Outline

SOP-8

unit: mm



Recommended soldering pad



unit: mm