

40V N-Channel Enhancement Mode MOSFET

V_{DS} = 40V

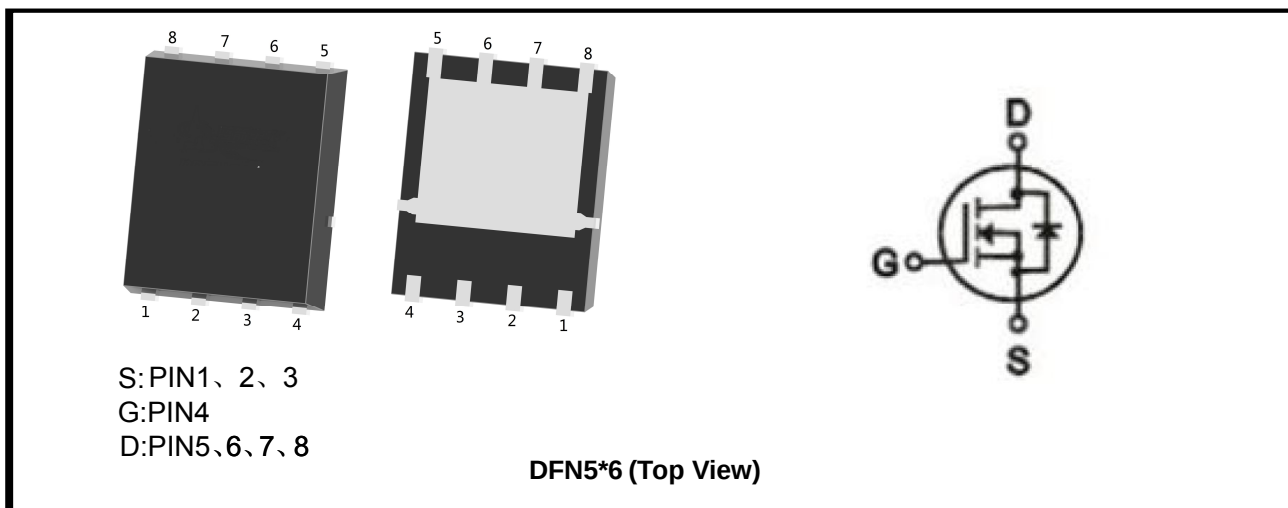
R_{DS(ON)}, V_{GS}@ 10.0V, I_{DS}@20.0A < 8.0mΩ

R_{DS(ON)}, V_{GS}@ 4.5V, I_{DS}@ 10.0A < 13mΩ

Features

Advanced trench process technology

High Density Cell Design For Ultra Low On-Resistance



Maximum Ratings and Thermal Characteristics (T_A = 25°C unless otherwise noted)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DSS}	40	V
Drain Current		I _D (T _C =25°C)	52	A
Drain Current - Pulsed		I _{DM}	110	A
Gate-Source Voltage		V _{GS}	±20	V
Single Pulsed Avalanche Energy		E _{AS}	67.6	mJ
Avalanche Current		I _{AS}	13	A
Power Dissipation		P _D (T _C =25°C)	36.5	W
Operating and Storage Temperature Range		T _J , T _{stg}	-55 to 150	°C
Thermal resistance, junction - ambient	t ≤ 10s	R _{θJA}	20	°C / W
	Steady-State		55	
Thermal resistance, junction - case	Steady-State	R _{θJC}	3.4	

Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=250\mu A$	40	47		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40V$ $V_{GS}=0V$			1	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			± 0.1	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	1.0	1.6	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=20A$		6.4	8	m Ω
		$V_{GS}=4.5V$ $I_D=10A$		10	13	m Ω
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=1A$			1.2	V
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		850		pF
Output Capacitance	C_{oss}			115		
Reverse Transfer Capacitance	C_{rss}			30		
Gate resistance	R_g	$V_{GS}=0V$ $V_{DS}=0V$ $f=1MHz$		2.4		Ω
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10V$ $V_{DS}=20V$ $I_D=20A$		21		nC
Total Gate Charge	$Q_{g(4.5V)}$			8.8		
Gate Source Charge	Q_{gs}			5.5		
Gate Drain Charge	Q_{gd}			3.1		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=20V$ $R_L=1.0\Omega$ $R_{GEN}=3.0\Omega$		7.5		ns
Turn-On Rise Time	t_r			2		
Turn-Off Delay Time	$t_{d(off)}$			24		
Turn-Off Fall Time	t_f			3		

Electrical Characteristic Curve

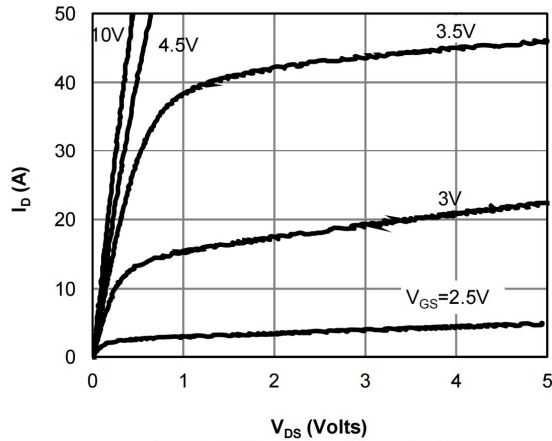


Figure 1: On-Region Characteristics

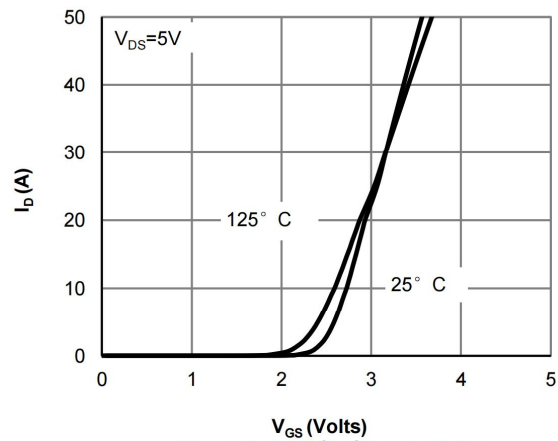


Figure 2: Transfer Characteristics

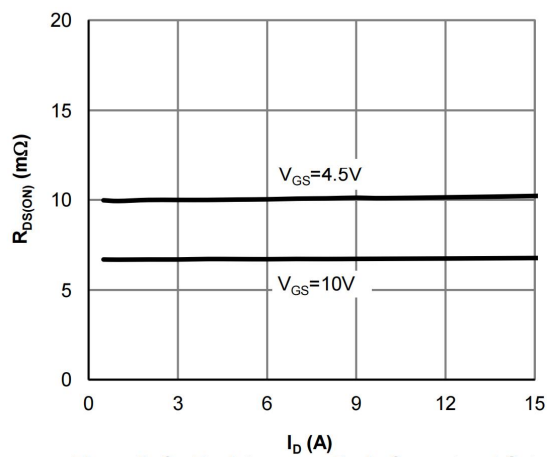


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

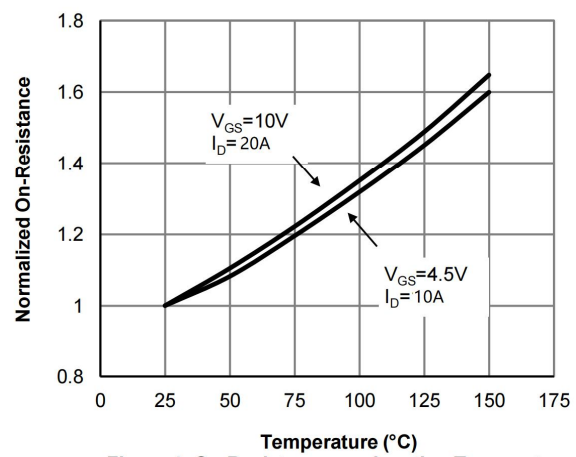


Figure 4: On-Resistance vs. Junction Temperature

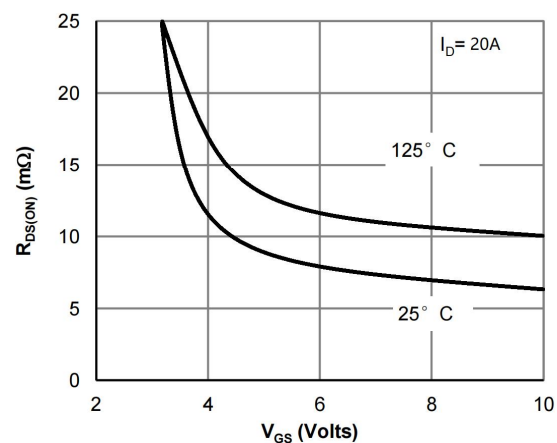


Figure 5: On-Resistance vs. Gate-Source Voltage

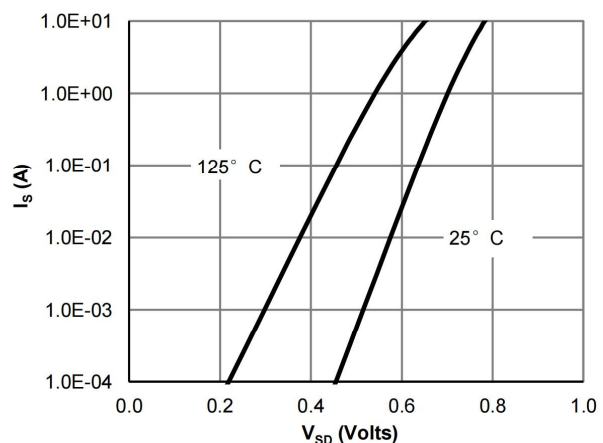


Figure 6: Body-Diode Characteristics

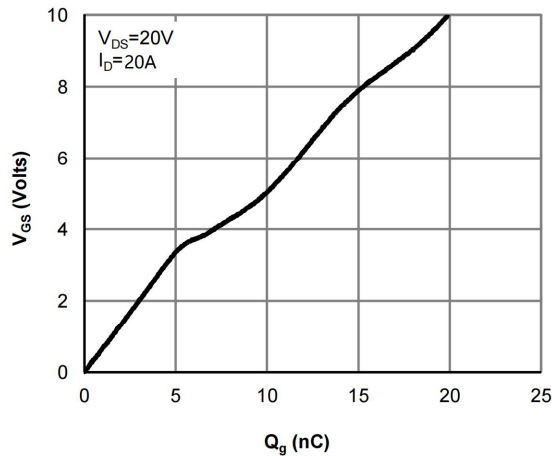


Figure 7: Gate-Charge Characteristics

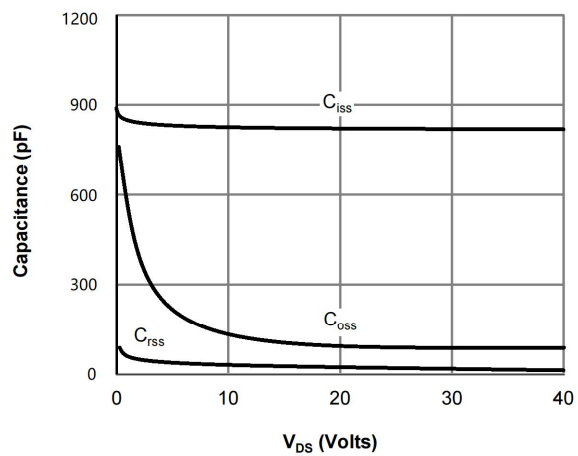


Figure 8: Capacitance Characteristics

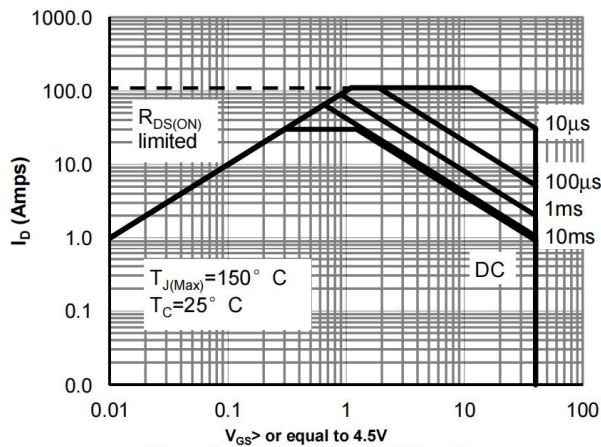


Figure 9: Maximum Forward Biased Safe Operating Area

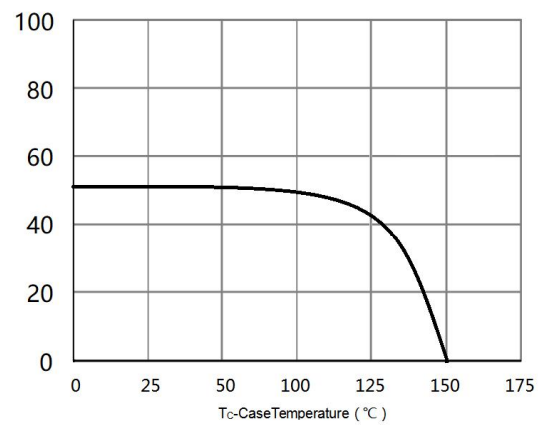


Figure 10: Maximum Continuous Drain Current Vs Case Temperature

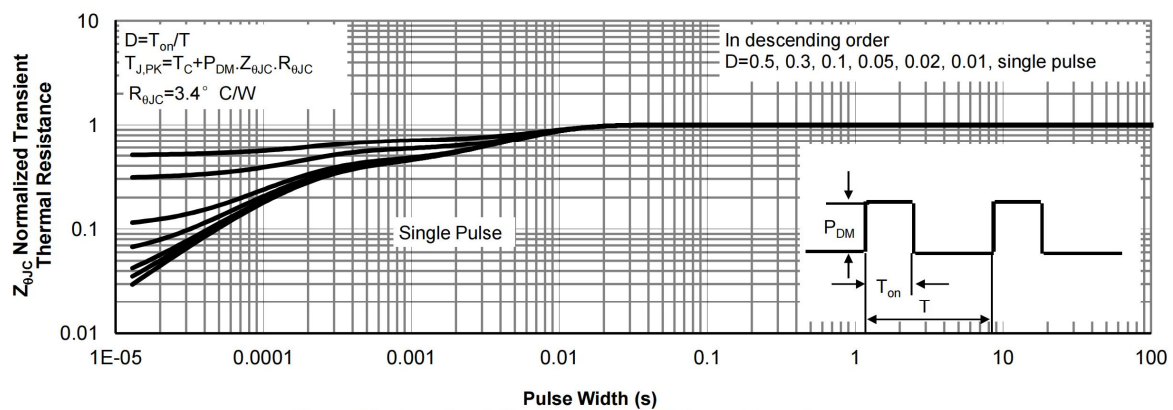


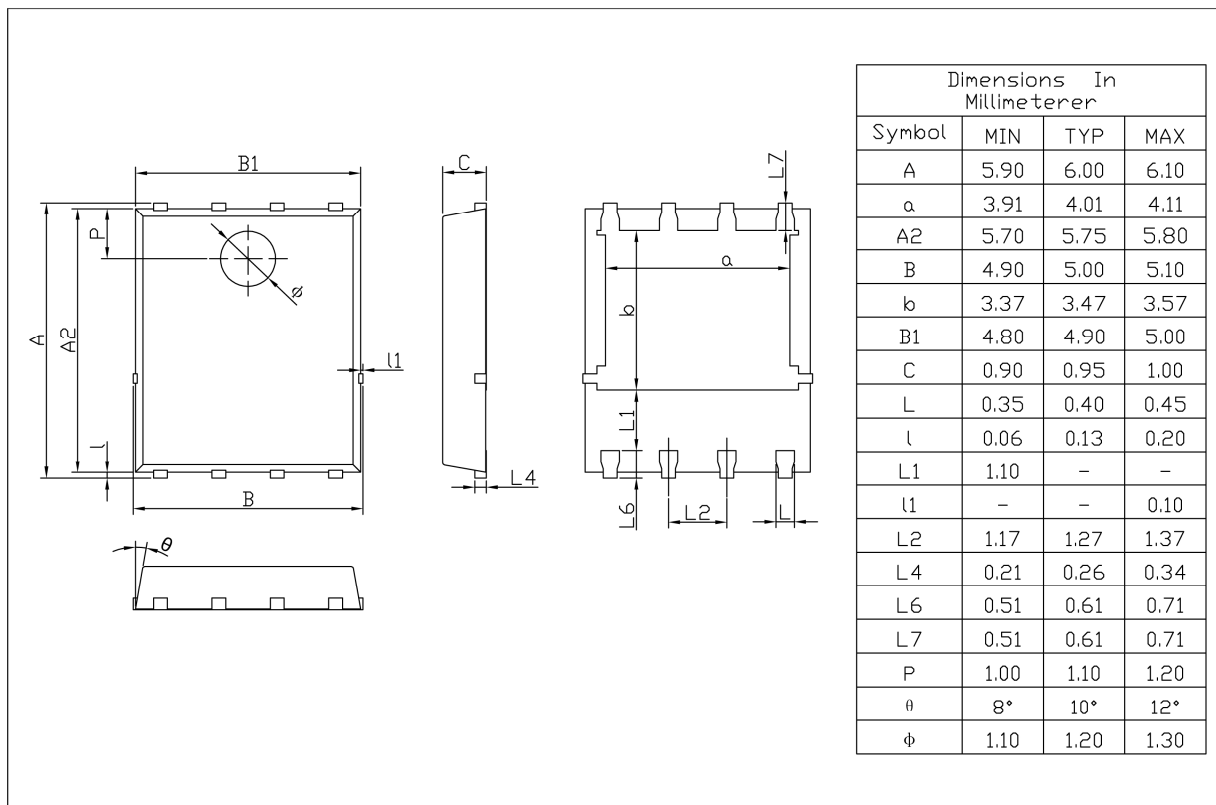
Figure 11: Normalized Maximum Transient Thermal Impedance

Dimension outline

Unit:mm

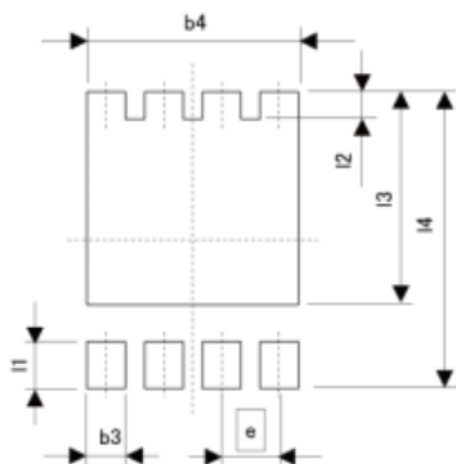
PDFN5 X6

Unit:mm



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Suggested Pad Layout



DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b3	-	0.68	-	0.027
b4	-	4.06	-	0.160
l1	-	0.81	-	0.032
l2	-	0.71	-	0.028
l3	-	4.49	-	0.177
l4	-	6.20	-	0.244