



Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	23mΩ@10V	16A
	30mΩ@4.5V	
-30V	33mΩ@-10V	-16A
	44mΩ@-4.5V	

Feature

- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested
- 100% ΔV_{DS} Tested

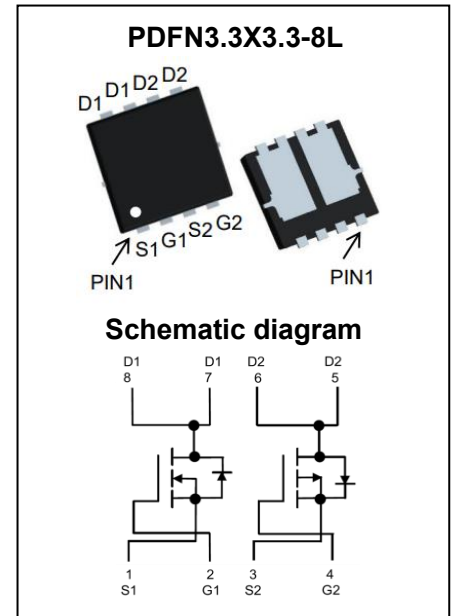
Application

- Load Switch
- DC/DC Converter

MARKING:



DE8404 = Device Code
XX = Date Code



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Value	Unit	
Drain - Source Voltage	V_{DS}	30	-30	V	
Gate - Source Voltage	V_{GS}	± 20	± 20	V	
Continuous Drain Current ¹	$T_C = 25^\circ\text{C}$	I_D	16	A	
	$T_C = 100^\circ\text{C}$	I_D	10	A	
Pulsed Drain Current ²	I_{DM}	24	-20	A	
Single Pulsed Avalanche Current ³	I_{AS}	7.6	14.9	A	
Single Pulsed Avalanche Energy ³	E_{AS}	14.4	55.5	mJ	
Power Dissipation ⁵	$T_C = 25^\circ\text{C}$	P_D	28	23	W
Thermal Resistance from Junction to Ambient ⁶	$R_{\theta JC}$	4.5	5.5	$^\circ\text{C/W}$	
Junction Temperature	T_J	150	150	$^\circ\text{C}$	
Storage Temperature	T_{STG}	-55~ +150	-55~ +150	$^\circ\text{C}$	

MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)
NMOS:

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V			1	μA
Gate - Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
On Characteristics⁴						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1	1.6	3	V
Drain-source On-resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 2.0A		22	33	mΩ
		V _{GS} = 4.5V, I _D = 2.0A		29	48	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz		461		pF
Output Capacitance	C _{oss}			62		
Reverse Transfer Capacitance	C _{rss}			45		
Gate Resistance	R _g	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz		2.1		Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 15V, V _{GS} = 10V, I _D = 2A		10.1		nC
Gate-source Charge	Q _{gs}			1.4		
Gate-drain Charge	Q _{gd}			2.1		
Turn-on Delay Time	t _{d(on)}	V _{DD} = 15V, V _{GS} = 10V, I _D = 5.6A, R _G = 3Ω		5		ns
Turn-on Rise Time	t _r			26		
Turn-off Delay Time	t _{d(off)}			13		
Turn-off Fall Time	t _f			21		
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	V _{GS} = 0V, I _S = 1.0A			1.2	V

MOSFET ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)
PMOS:

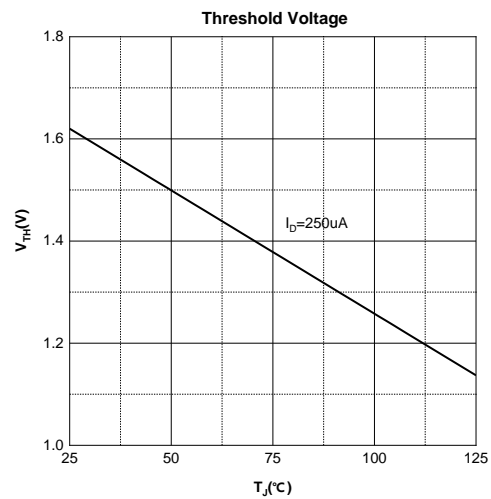
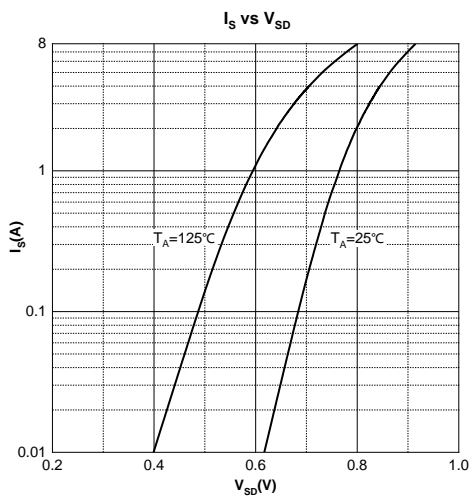
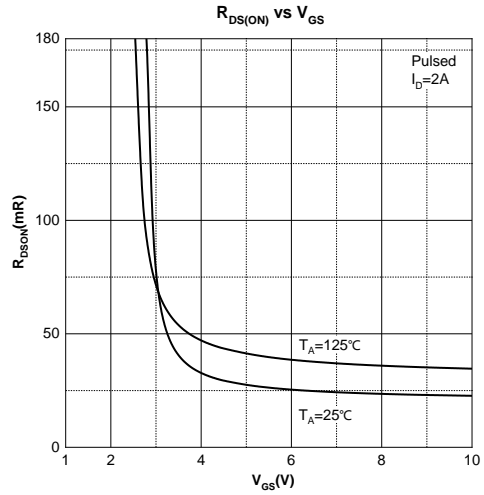
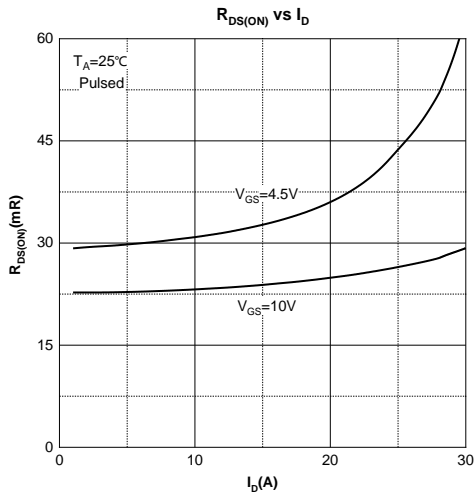
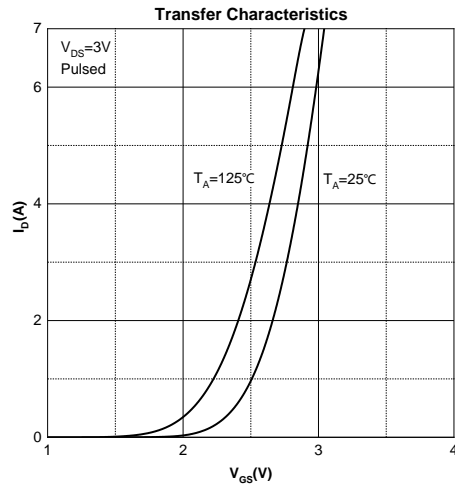
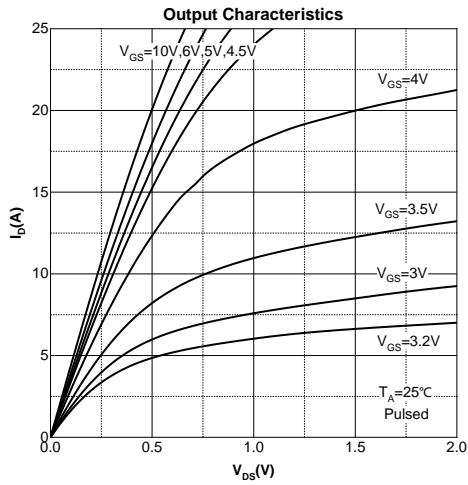
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$			-1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics⁴						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.5	-3	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -2.0A$		31	46	m Ω
		$V_{GS} = -4.5V, I_D = -2.0A$		43	72	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = 0V, f = 1MHz$		940		pF
Output Capacitance	C_{oss}			102		
Reverse Transfer Capacitance	C_{rss}			90		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		15.1		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = -15V, V_{GS} = -10V, I_D = -2A$		20.4		nC
Gate-source Charge	Q_{gs}			2.4		
Gate-drain Charge	Q_{gd}			4.0		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -15V, V_{GS} = -10V, I_D = -5.1A,$ $R_G = 3\Omega$		7.1		ns
Turn-on Rise Time	t_r			36		
Turn-off Delay Time	$t_{d(off)}$			31		
Turn-off Fall Time	t_f			42		
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	$V_{GS} = 0V, I_S = -1.0A$			-1.2	V

Notes :

- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
3. E_{AS} condition: $V_{DD} = \pm 15V, V_{GS} = \pm 10V, L = 0.5mH, R_G = 25\Omega$ Starting $T_J = 25^\circ\text{C}$.
- 4.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.And device mounted on a large heatsink
- 6.Device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

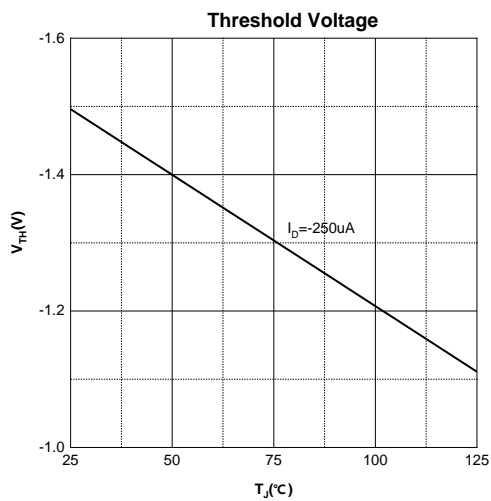
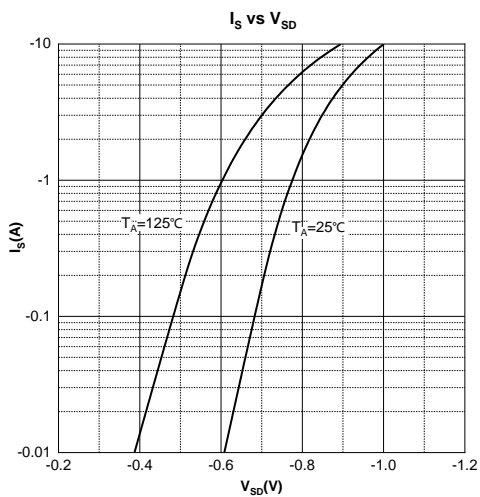
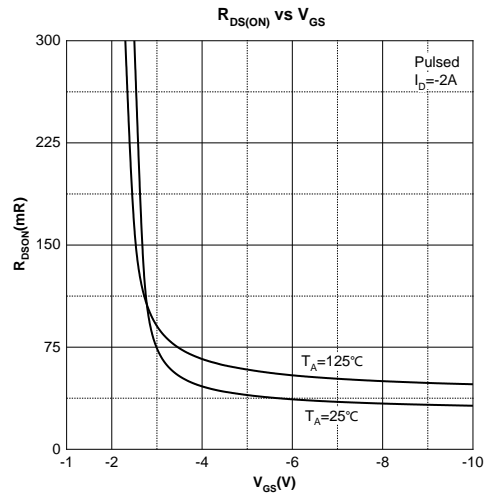
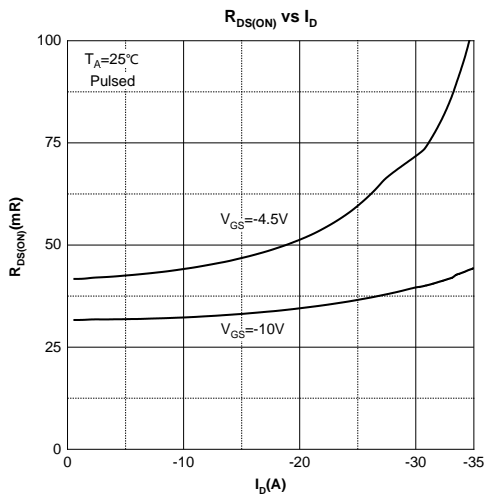
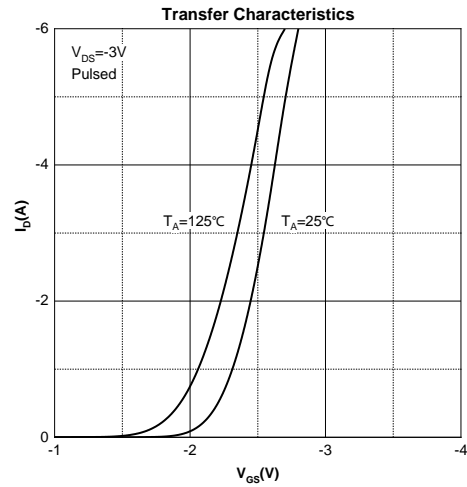
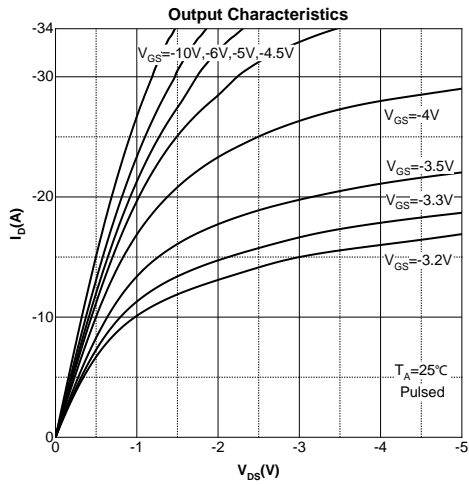
Typical Characteristics

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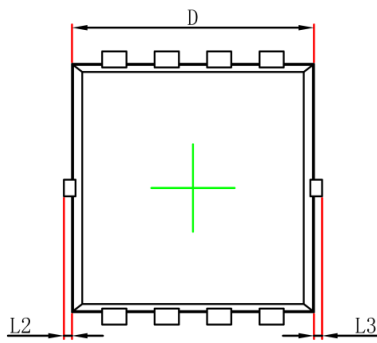


Typical Characteristics

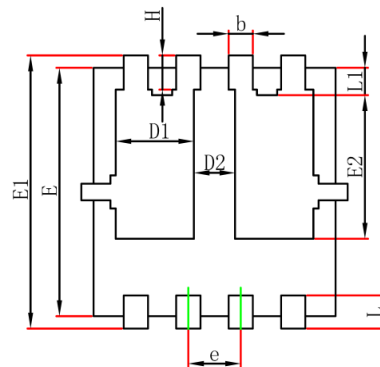
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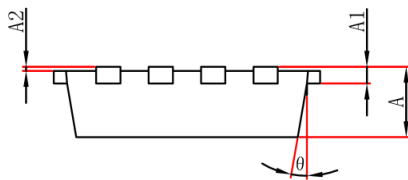
PDFN3.3X3.3-8L Package Information



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.152REF		0.006REF	
A2	0.000	0.050	0.000	0.002
D	2.900	3.200	0.114	0.126
D1	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
E	2.900	3.200	0.114	0.126
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	0.000	0.100	0.000	0.004
L3	0.000	0.100	0.000	0.004
H	0.315	0.515	0.012	0.020
θ	0°	12°	0°	12°