



Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-30V	35mΩ@-10V	-4A
	53mΩ@-4.5V	
30V	25mΩ@10V	5A
	35mΩ@4.5V	

Feature

- Low drain-source ON-resistance
- High forward transfer admittance
- Low leakage current
- Enhancement mode

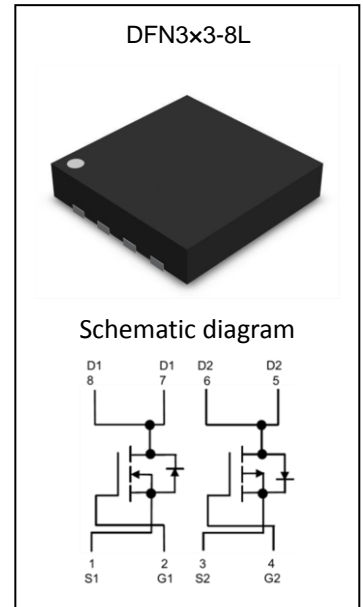
Application

- Portable equipment
- Motor drive

MARKING:



DE8404 = Device Code
XX = Date Code



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

Parameter	Symbol	Value	Unit
P-MOSFET			
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ⁽¹⁾	I_D	-4	A
Pulsed Drain Current	I_{DM}	-16	A
Power Dissipation	P_D	3	W
N-MOSFET			
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	5	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	20	A
Power Dissipation	P_D	3	W
Temperature and Thermal Resistance			
Thermal Resistance from Junction to Ambient ⁽²⁾	$R_{\theta JA}$	42	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

P-channel MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static 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
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1	-1.5	-3.0	V
Drain-source on-resistance ⁽³⁾	R _{DS(on)}	V _{GS} = -10V, I _D = -2.0A		35	50	mΩ
		V _{GS} = -4.5V, I _D = -2.0A		53	80	
Forward tranconductance	g _{FS}	V _{DS} = -5V, I _D = -1.0A	5			S
Diode forward voltage ⁽³⁾	V _{DS}	I _S = -1.0A, V _{GS} = 0V		-0.8	-1.2	V
Dynamic characteristics⁽⁴⁾						
Input Capacitance	C _{iSS}	V _{DS} = -15V, V _{GS} = 0V, F = 1.0MHz		850		pF
Output Capacitance	C _{oSS}			101		
Reverse Transfer Capacitance	C _{rSS}			65		
Total gate charge	Q _g	V _{DS} = -15V, I _D = -4A, V _{GS} = -4.5V		9.5		nC
Gate-source charge	Q _{gs}			2		
Gate-drain charge	Q _{gd}			3		
Switching Characteristics⁽⁴⁾						
Turn-on delay time	t _{d(on)}	V _{DD} = -15V, I _D = -4A V _{GS} = -10V, R _{GEN} = 6Ω		7		nS
Turn-on rise time	t _r			3		
Turn-off delay time	t _{d(off)}			20		
Turn-off fall time	t _f			12		

N-channel MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

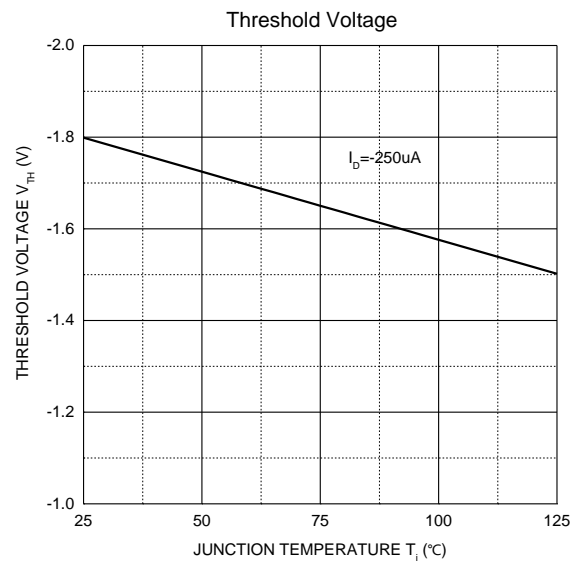
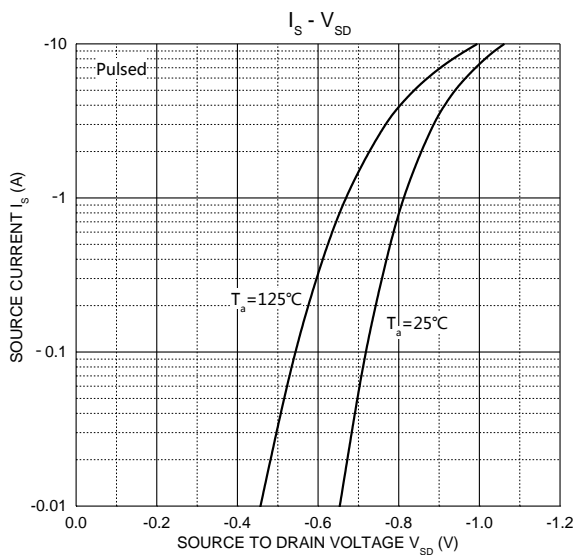
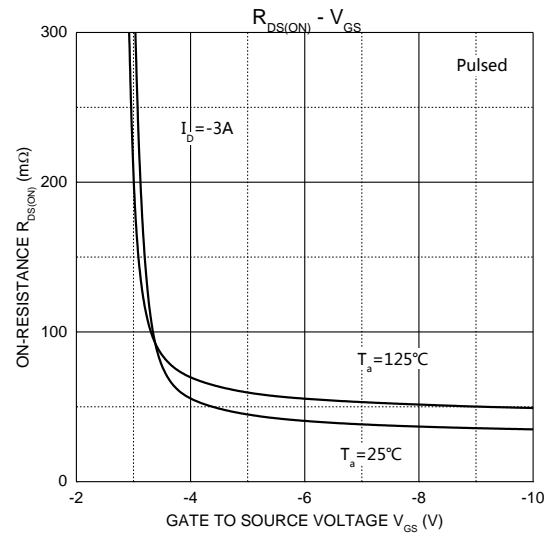
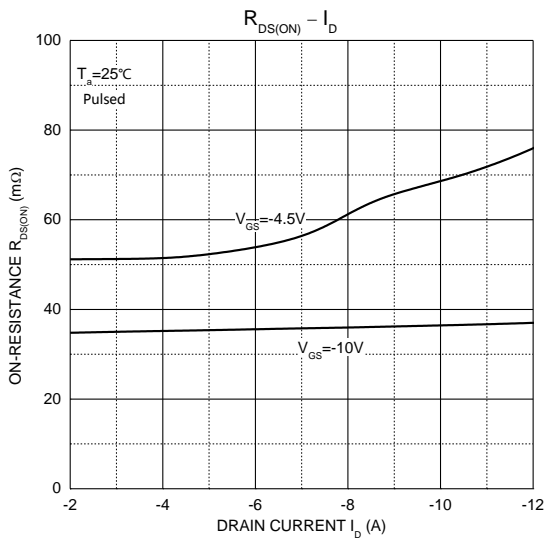
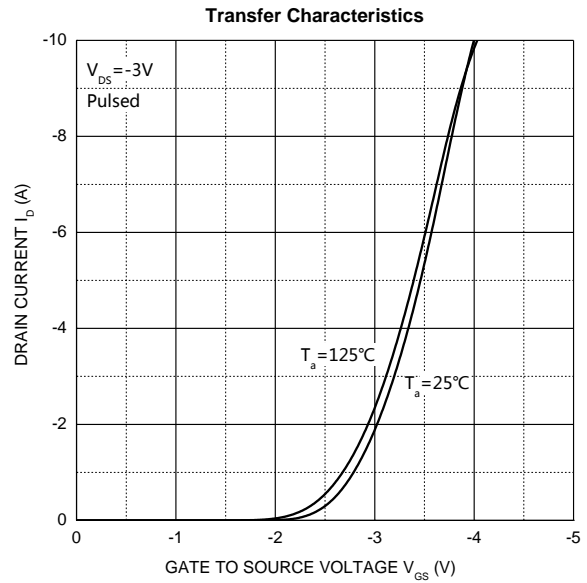
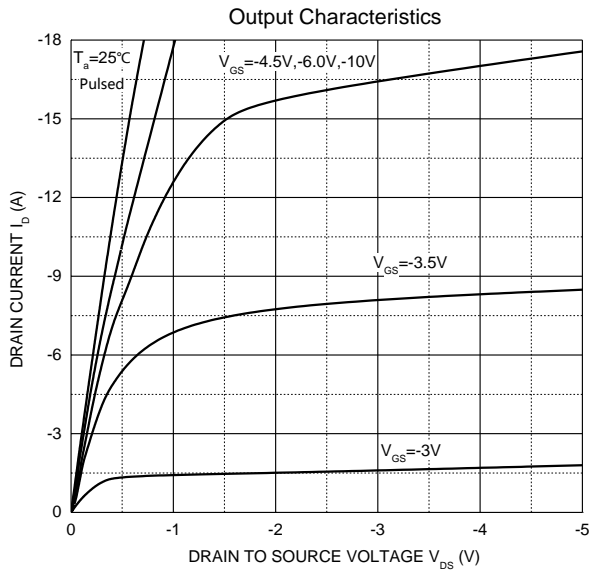
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	3.0	V
Drain-source on-resistance ⁽³⁾	R _{DS(on)}	V _{GS} =10V, I _D =2.0A		25	35	mΩ
		V _{GS} =4.5V, I _D =2.0A		35	50	
Forward tranconductance	g _{FS}	V _{DS} =5V, I _D =1.0A	5			S
Diode Forward voltage ⁽³⁾	V _{DS}	I _S =1.0A, V _{GS} = 0V		0.8	1.2	V
Dynamic characteristics⁽⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, F=1.0MHz		633		pF
Output Capacitance	C _{oss}			65		
Reverse Transfer Capacitance	C _{rss}			55		
Total gate charge	Q _g	V _{DS} =15V, I _D =5.8A, V _{GS} =4.5V		9.5		nC
Gate-source charge	Q _{gs}			1.5		
Gate-drain charge	Q _{gd}			3		
Switching Characteristics⁽⁴⁾						
Turn-on delay time	t _{d(on)}	V _{DD} =15V, R _L =2.7Ω V _{GS} =10V, R _{GEN} =3Ω		3.3		ns
Turn-on rise time	t _r			4.8		
Turn-off delay time	t _{d(off)}			26		
Turn-off fall time	t _f			4		

Notes:

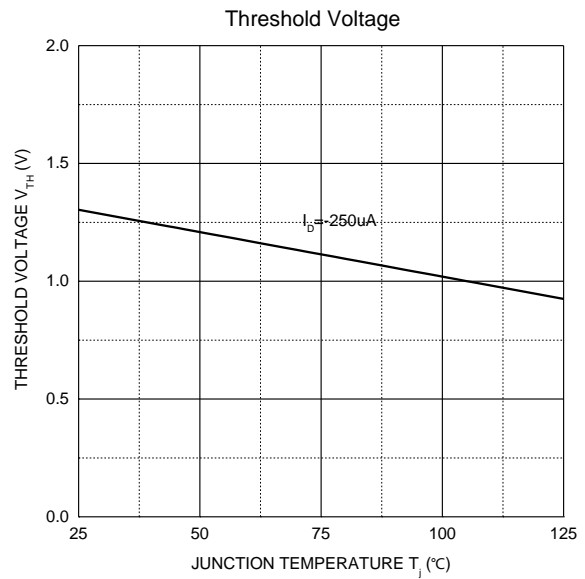
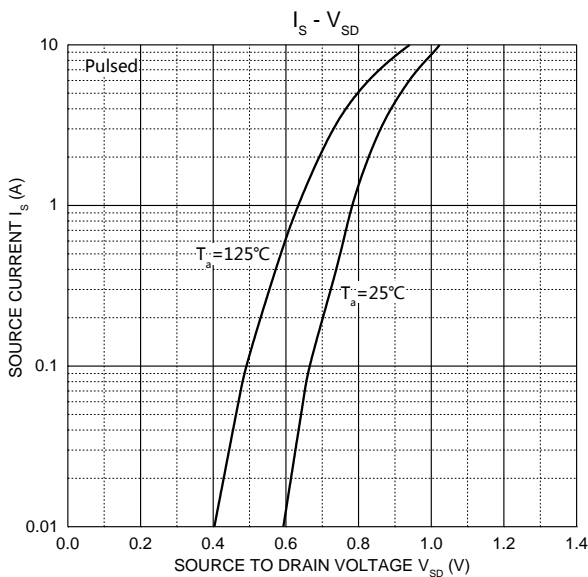
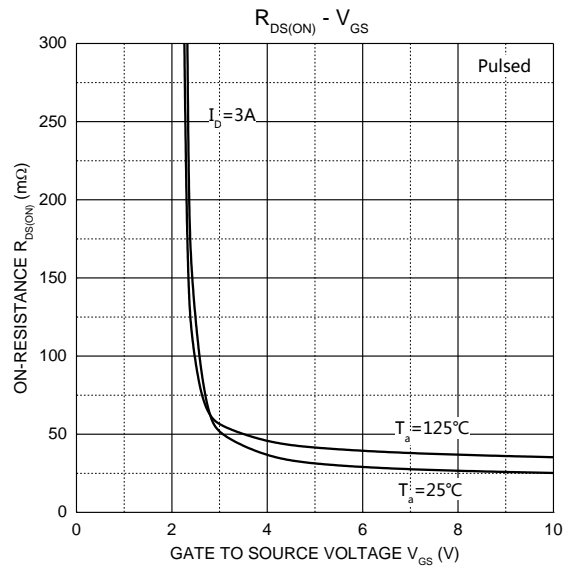
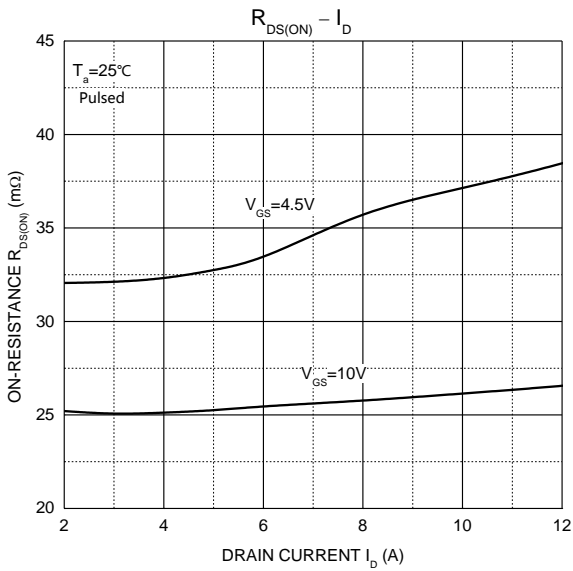
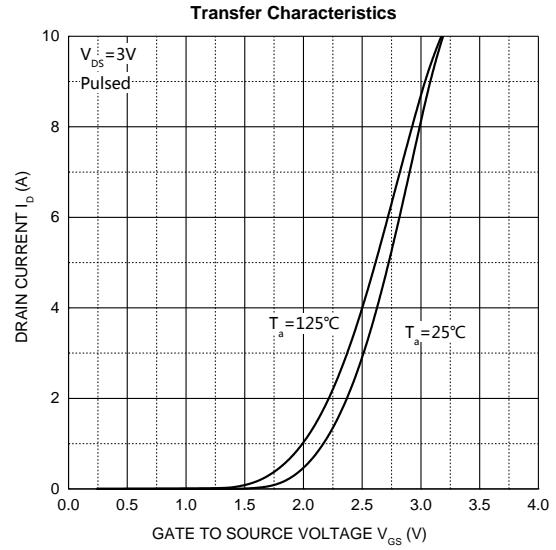
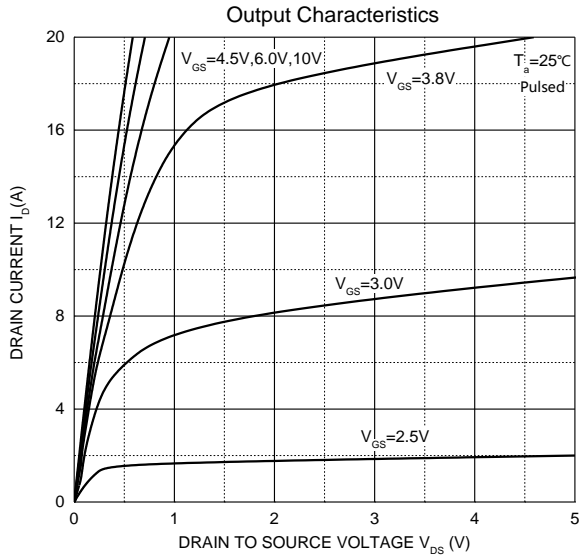
1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

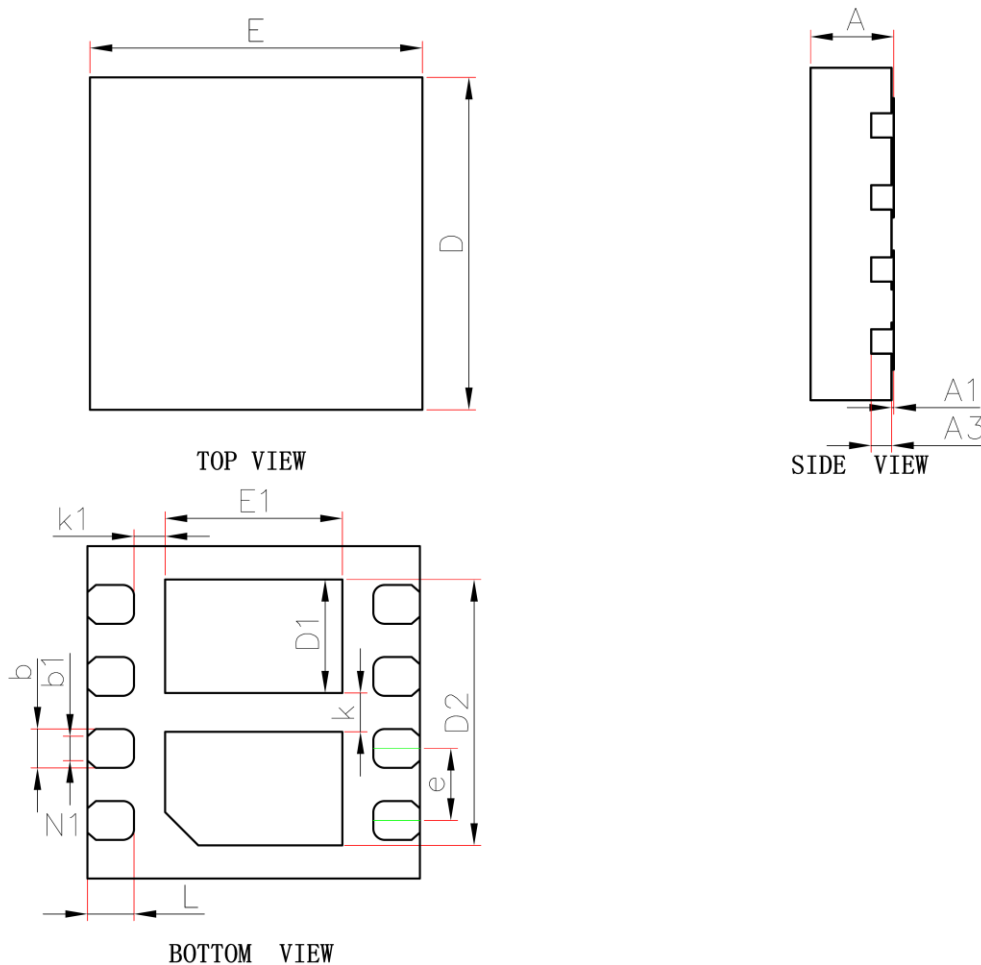
P-Channel MOS



N-Channel MOS



DFN3x3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN.	MAX.	MIN.	MAX.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	2.900	3.100	0.114	0.122
E	2.900	3.100	0.114	0.122
D1	0.925	1.125	0.036	0.044
E1	1.500	1.700	0.059	0.067
D2	2.300	2.500	0.091	0.098
b	0.300	0.400	0.012	0.016
b1	0.220REF		0.009REF	
e	0.650BSC.		0.026BSC.	
k	0.350REF		0.014REF	
k1	0.280REF		0.011REF	
L	0.370	0.470	0.015	0.019