

P-Channel Enhancement Mode Power MOSFET

● Features

$$V_{DS} = -20V,$$

$$I_D = -34A$$

$$R_{DS(ON)} @V_{GS} = -4.5V, \text{ TYP } 12.1m\Omega$$

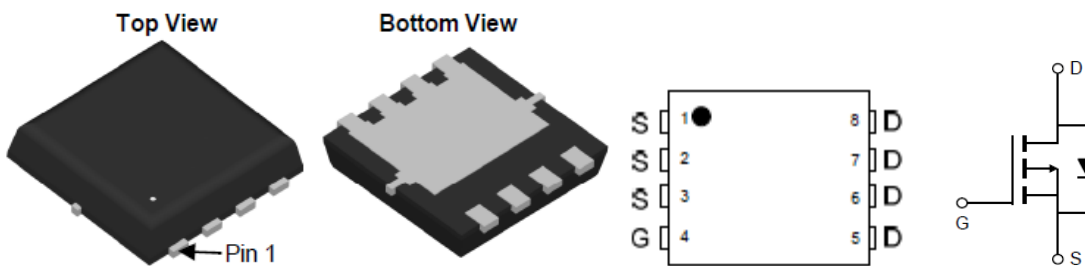
$$R_{DS(ON)} @V_{GS} = -2.5V, \text{ TYP } 14.3m\Omega$$

$$R_{DS(ON)} @V_{GS} = -1.8V, \text{ TYP } 18m\Omega$$

● General Description

- DC-DC Converters
- Backlighting
- Power Management Functions

● Pin Configurations



DFN3*3-8L

● Absolute Maximum Ratings @ $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	± 12	V
Drain Current (Continuous) *AC	I_D	$T_c=25^\circ\text{C}$	-34
		$T_c=70^\circ\text{C}$	-27.3
Drain Current (Pulse) *B	I_{DM}	136	A
Power Dissipation	P_D	30	W
Operating Temperature/ Storage Temperature	T_J/T_{STG}	-55~150	$^\circ\text{C}$

● Thermal Resistance Ratings

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient	R_{thJA}	60	75	$^\circ\text{C/W}$
Maximum Junction-to-Case (Drain)	R_{thJC}	3.5	4.2	

● Electrical Characteristics @ $T_A=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250 \mu A$	-20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$	--	--	-1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = -250 \mu A$	-0.4	-0.51	-1.5	V
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$	--	--	± 100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = 12A$	--	12.1	17	m Ω
	$R_{DS(on)}$	$V_{GS} = -2.5V, I_D = 8A$	--	14.3	20	m Ω
	$R_{DS(on)}$	$V_{GS} = -1.8V, I_D = 5A$	--	18	25	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = -5V, I_D = -14A$	--	72	--	S
Diode Forward Voltage	V_{SD}	$I_{SD} = -1A, V_{GS} = 0V$	--	--	-1	V
Diode Forward Current	I_S	$T_C = 25^{\circ}\text{C}$	--	--	-34	A
Switching						
Total Gate Charge	Q_g	$V_{GS} = -4.5V, V_{DS} = -10V, I_D = -14A$	--	44	--	nC
Gate-Source Charge	Q_{gs}		--	9	--	nC
Gate-Drain Charge	Q_{gd}		--	11	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = -4.5V, V_{DS} = -10V,$ $R_L = 0.75\Omega, R_{GEN} = 3\Omega$	--	18	--	ns
Turn-on Rise Time	t_r		--	32	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	136	--	ns
Turn-Off Fall Time	t_f		--	59	--	ns
Dynamic						
Input Capacitance	C_{iss}	$V_{DS} = -10V, V_{GS} = 0V,$ $f = 1.0\text{MHz}$	--	3495	--	pF
Output Capacitance	C_{oss}		--	528	--	pF
Reverse Transfer Capacitance	C_{rss}		--	425	--	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the $\leq 10\text{s}$ junction to ambient thermal resistance rating.

● Typical Performance Characteristics ((T_J = 25 °C, unless otherwise noted))

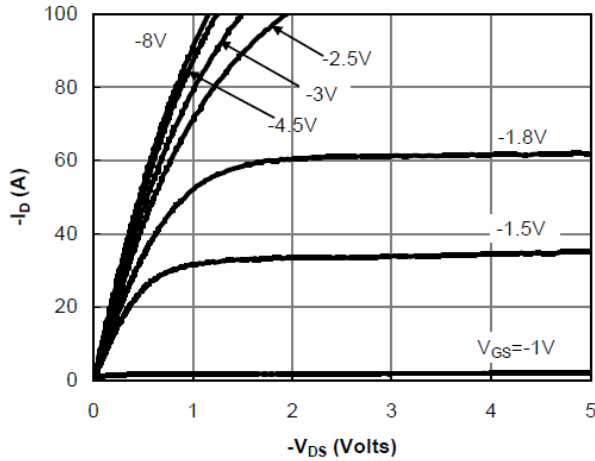


Fig 1: On-Region Characteristics

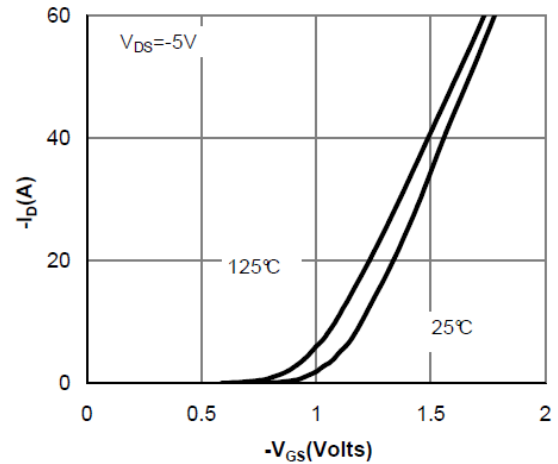


Figure 2: Transfer Characteristics

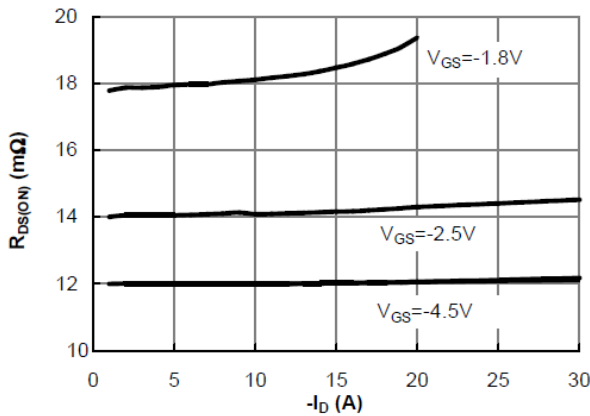


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

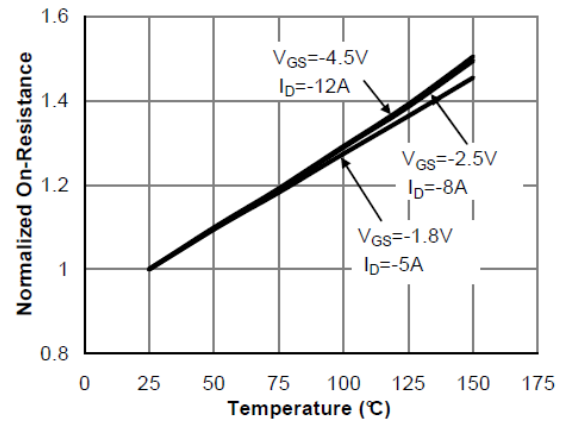


Figure 4: On-Resistance vs. Junction Temperature

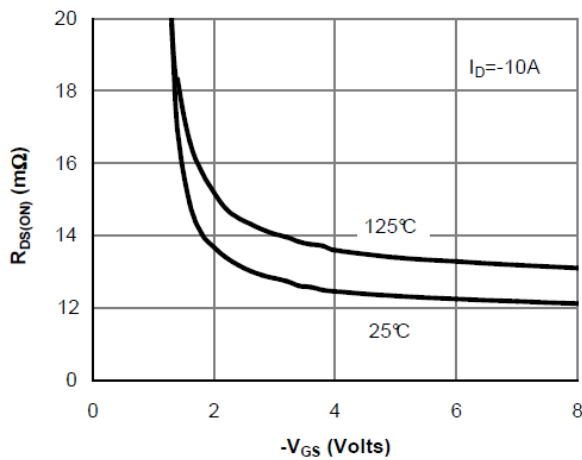


Figure 5: On-Resistance vs. Gate-Source Voltage

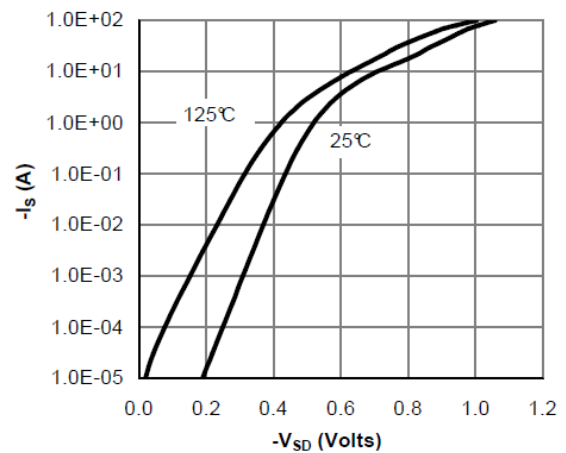


Figure 6: Body-Diode Characteristics

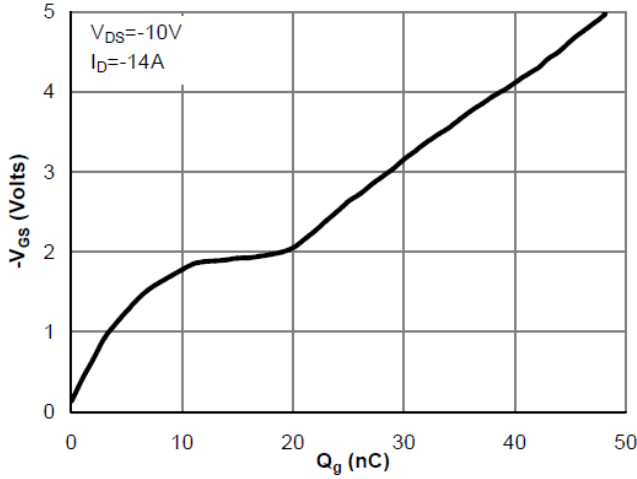


Figure 7: Gate-Charge Characteristics

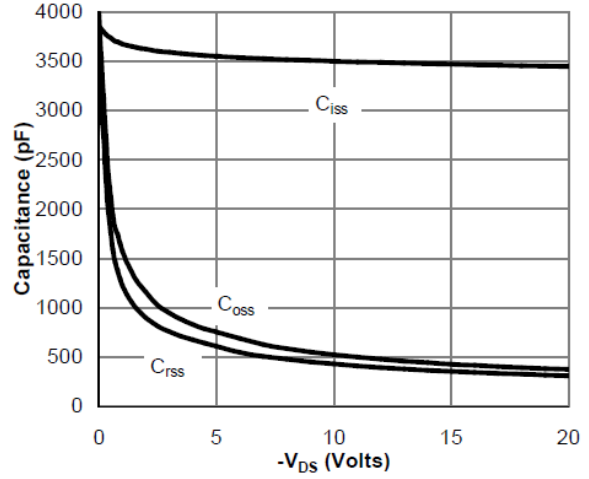


Figure 8: Capacitance Characteristics

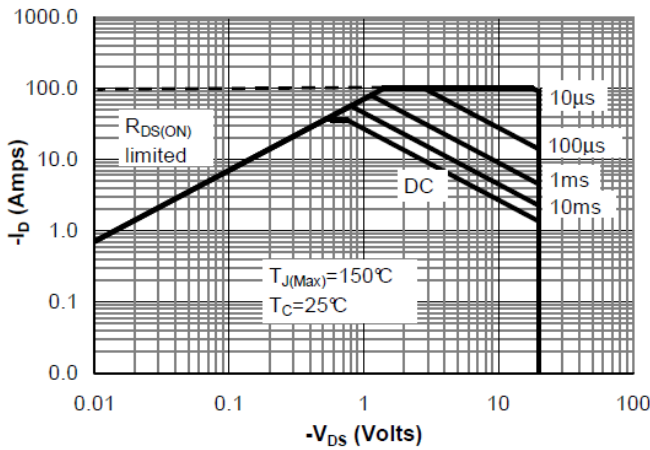


Figure 9: Maximum Forward Biased Safe Operating Area

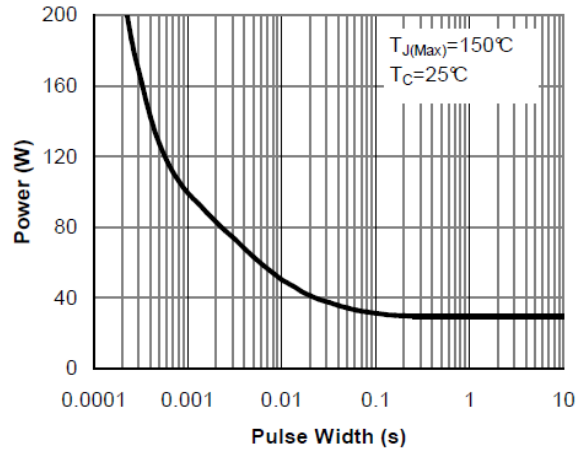


Figure 10: Single Pulse Power Rating Junction-to-Case

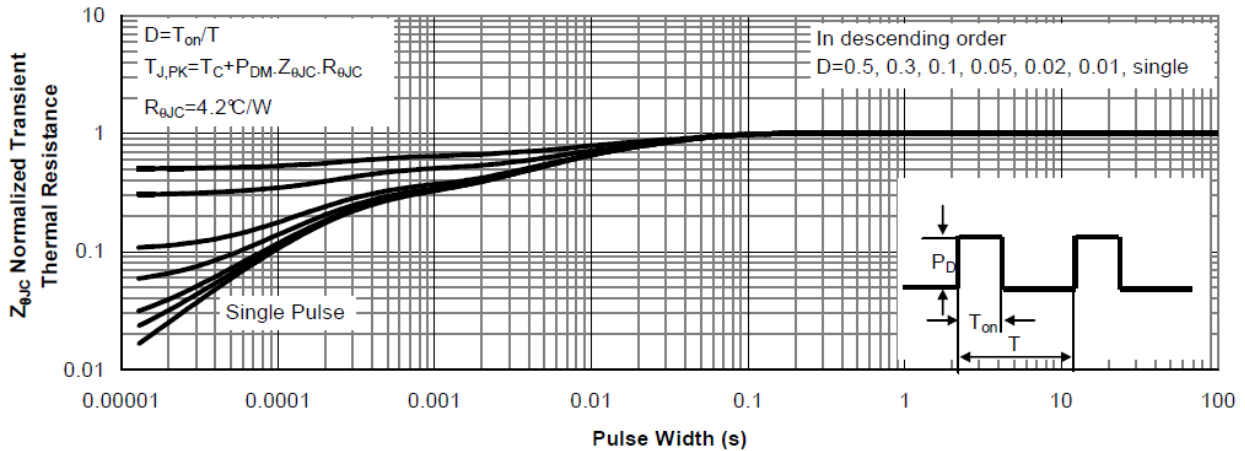
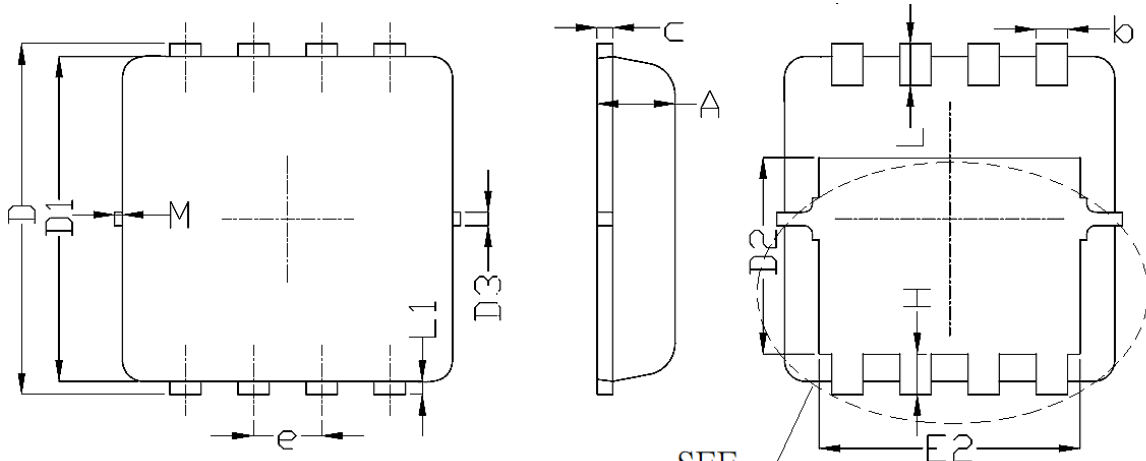
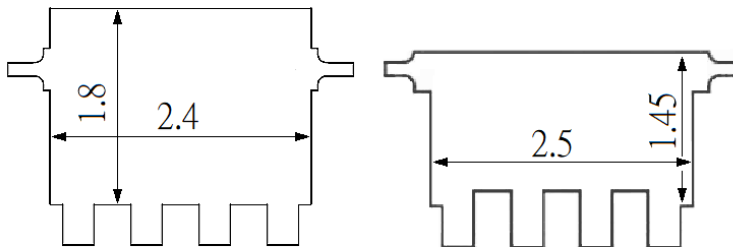
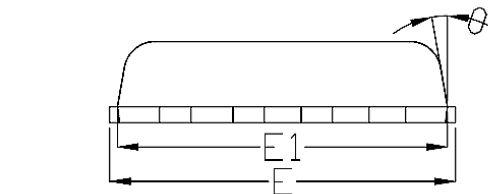


Figure 11: Normalized Maximum Transient Thermal Impedance

● Package Information



SEE
DETAIL



OPTION 1

OPTION 2

DETAIL

SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.7	0.775	0.85
b	0.25	0.3	0.35
c	0.1	0.15	0.25
D	3.15	3.3	3.4
D1	2.95	3.1	3.2
D2	1.7	1.8	1.93
D3		0.13	
E	3.05	3.25	3.35
E1	2.95	3.15	3.2
E2	2.3	2.4	2.55
e	0.65 BSC		
H	0.33	0.43	0.53
L	0.3	0.4	0.5
L1	0.08	0.13	0.18
θ	-	10°	12°
M	-	-	0.15