

-11.5A, -15V P-Channel Power MOSFET

GENERAL DESCRIPTION

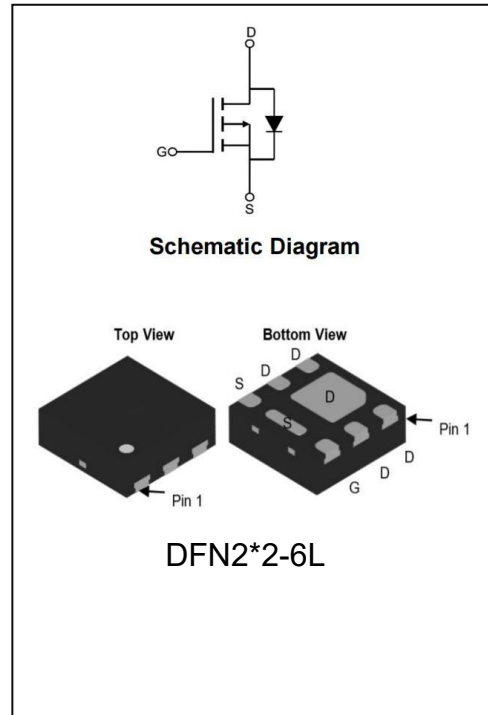
The Power MOSFET has extremely low on resistance, making it especially suitable for applications which require superior power density and outstanding efficiency.

Features

- ◆ $V_{DS} = -15V, I_D = -11.5A$
- ◆ $R_{DS(ON)}$
 TYP: $13m\Omega @ V_{GS} = -4.5V$
 TYP: $20m\Omega @ V_{GS} = -2.5V$

Applications

- ◆ Interfacing Switching
- ◆ Load Switching
- ◆ Power management



ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SFR01508PT	DFN2*2-6L	01508PT	Pb Free	Reel

ABSOLUTE MAXIMUM RATINGS (T_J=25°C unless otherwise noted)

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V _{DS}	-15	V
Gate-Source Voltage		V _{GS}	±12	
Drain Current	T _C = 25°C	I _D	-11.5	A
	T _C = 75°C		-7.8	
Drain Current Pulsed(Note 1)		I _{DM}	-46	
Power Dissipation(T _C =25°C) -Derate above 25°C		P _D	3.0	W
Operation Junction Temperature Range		T _J	-55~+150	°C
Storage Temperature Range		T _{stg}	-55~+150	
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		TL	300	

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain -Source Breakdown Voltage	B _{VDS}	V _{GS} = 0V, I _D = -250μA	-15	--	--	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = -15V, V _{GS} = 0V	--	--	1.0	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = 12V, V _{DS} = 0V	--	--	100	nA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = -12V, V _{DS} = 0V	--	--	-100	
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _D = -250μA	-0.5	-0.7	-1.0	V
Static Drain- Source On State Resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -5.0A	--	13	17	mΩ
		V _{GS} = -2.5V, I _D = -4.0A	--	20	25	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = -10V V _{GS} = 0V f=1.0MHZ	--	1436	--	pF
Output Capacitance	C _{oss}		--	312	--	
Reverse Transfer Capacitance	C _{rss}		--	279	--	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} = -10V, V _{GS} = -4.5V R _G = 3Ω, I _D = -5.0A (Note 3.4)	--	15.9	--	nS
Turn-on Rise Time	t _r		--	64.5	--	
Turn-off Delay Time	t _{d(off)}		--	72.2	--	
Turn-off Fall Time	t _f		--	62.9	--	
Total Gate Charge	Q _g	V _{DS} =-10V, I _D =-5A V _{GS} =-4.5V (Note 3.4)	--	16	--	nC
Gate-Source Charge	Q _{gs}		--	3.6	--	
Gate-Drain Charge	Q _{gd}		--	4.3	--	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	Integral Reverse P-N Junction Diode in the MOSFET	--	--	-11.5	A
Pulsed Source Current	I_{SM}		--	--	-46	
Diode Forward Voltage	V_{SD}	$I_S = -3A, V_{GS} = 0V$	--	-0.8	-1.2	V

NOTE:

1. Pulse width limited by maximum junction temperature
2. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
3. Essentially independent of operating temperature

Typical Performance Characteristics

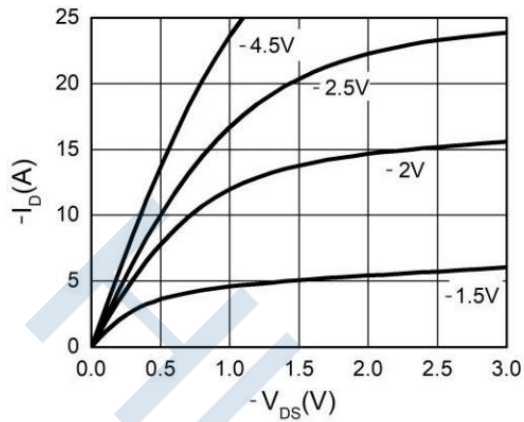


Figure 1. Output Characteristics

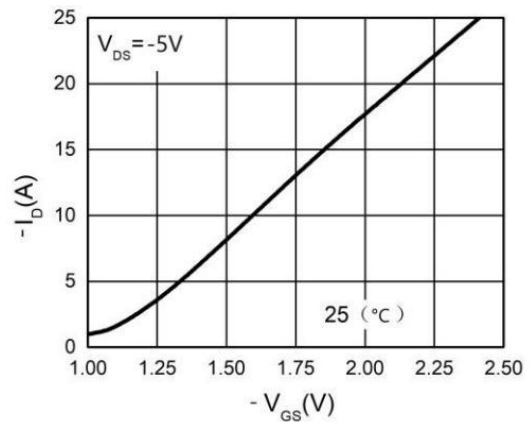


Figure 2. Transfer Characteristics

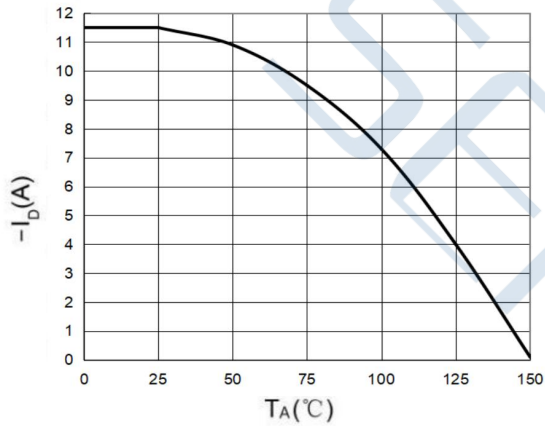


Figure 3. Power Dissipation

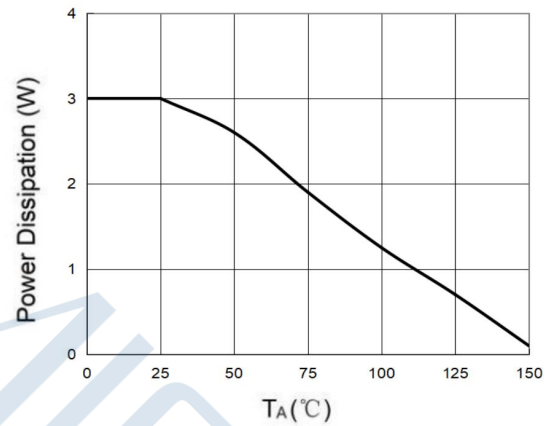


Figure 4. Drain Current

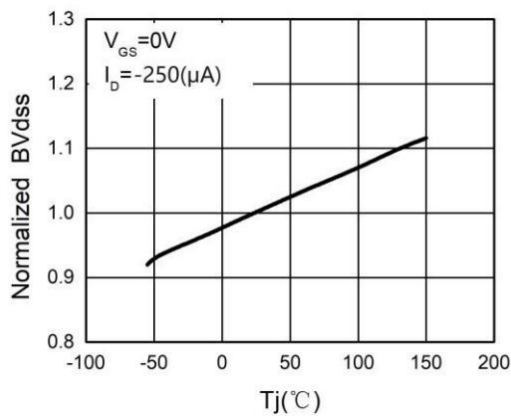


Figure 5. BV_{DS} vs Junction Temperature

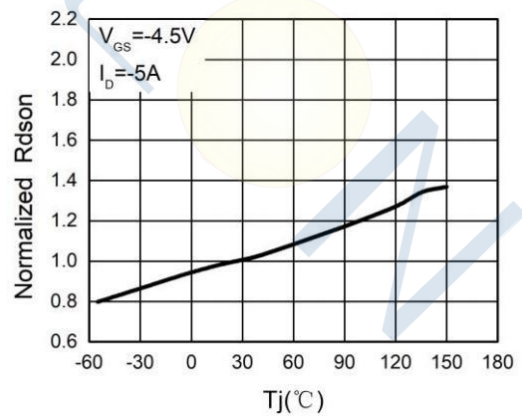


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

Typical Performance Characteristics

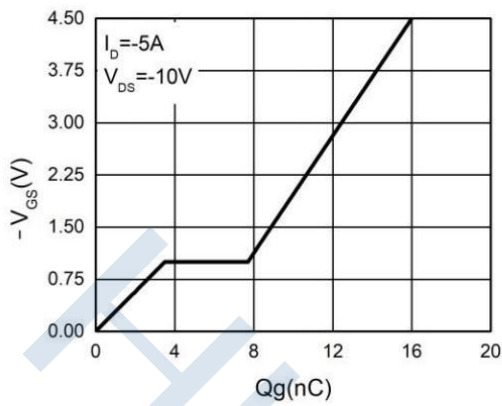


Figure 7. Gate Charge Waveforms

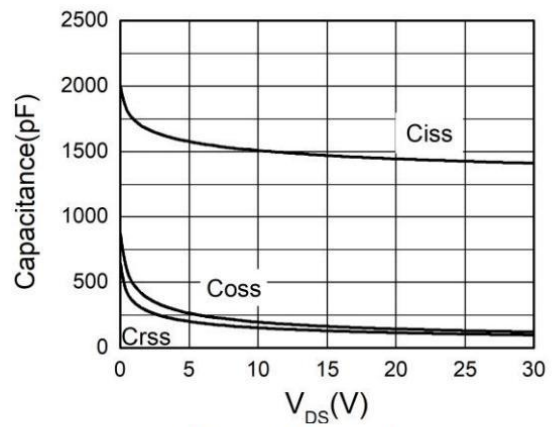


Figure 8. Capacitance

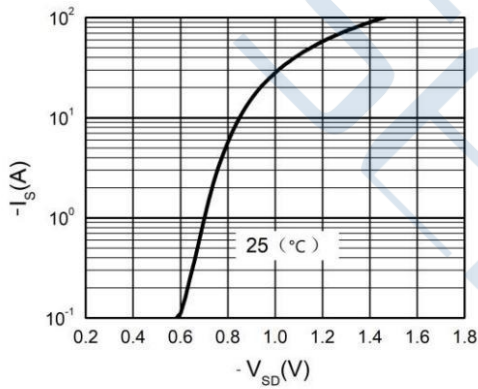


Figure 9. Body-Diode Characteristics

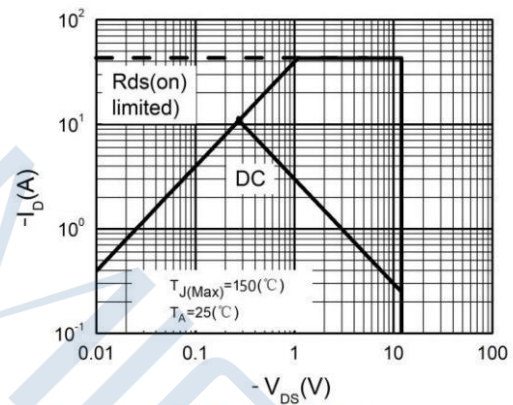
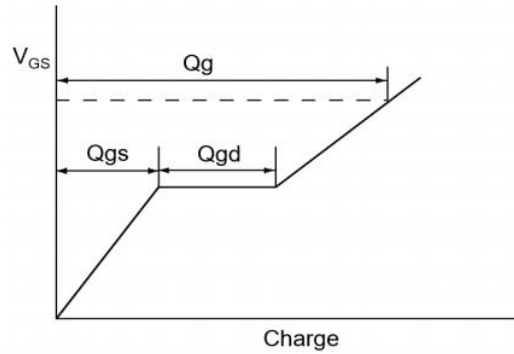
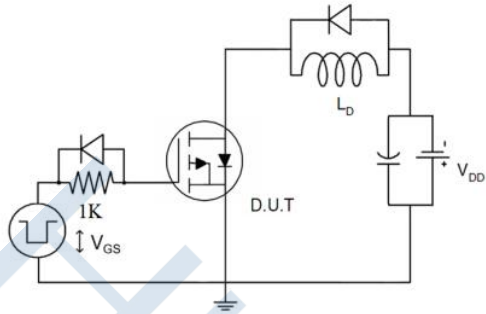


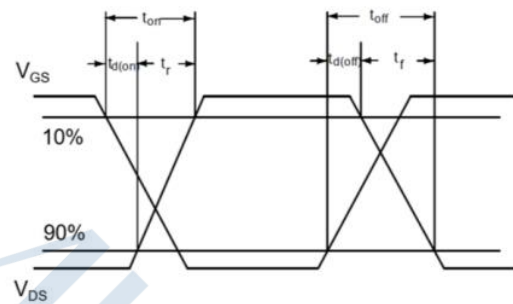
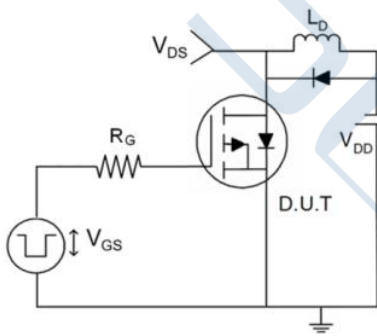
Figure 10. Maximum Safe Operating Area

Test Circuit

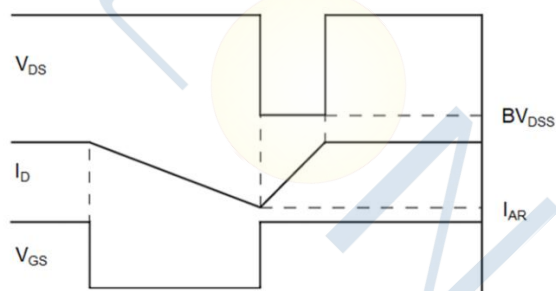
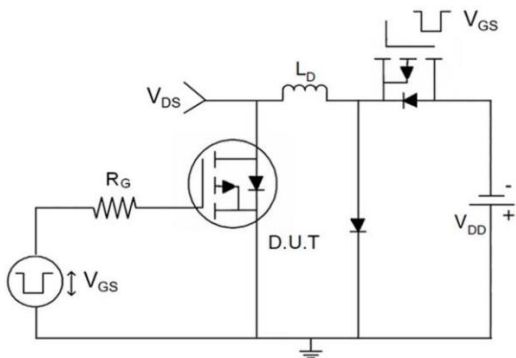
Gate Charge Test Circuit



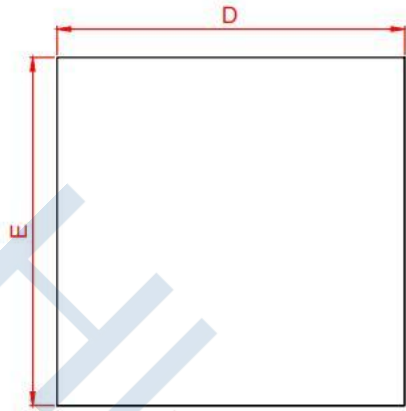
Switch Time Test Circuit



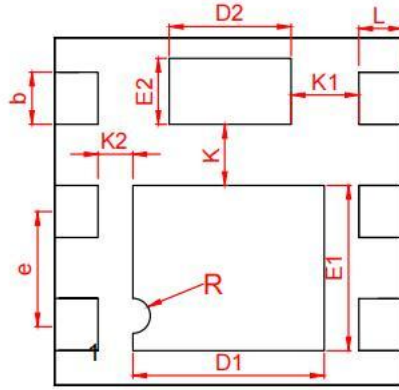
Unclamped Inductive Switching (UIS) Test Circuit



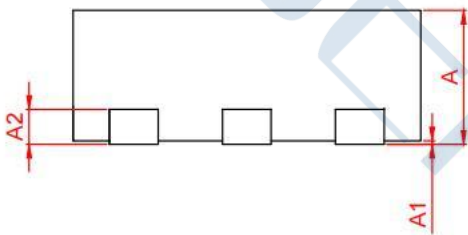
Package Dimensions of DFN2*2-6L



TOP VIEW



BOTTOM VIEW



SIDE VIEW

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
*A1	0.00	0.02	0.05
*b	0.25	0.30	0.35
*A2	0.203 BSC		
*D	1.90	2.00	2.10
*E	1.90	2.00	2.10
*E1	0.90	0.95	1.00
*E2	0.33	0.38	0.43
*D1	1.10	1.15	1.20
*D2	0.65	0.70	0.75
*e	0.65 REF		
*L	0.22	0.25	0.27
*K	0.30	0.35	0.40
*K1	0.35	0.40	0.45
*K2	0.18	0.20	0.22

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