

-7A,-15V P-Channel Power MOSFET

GENERAL DESCRIPTION

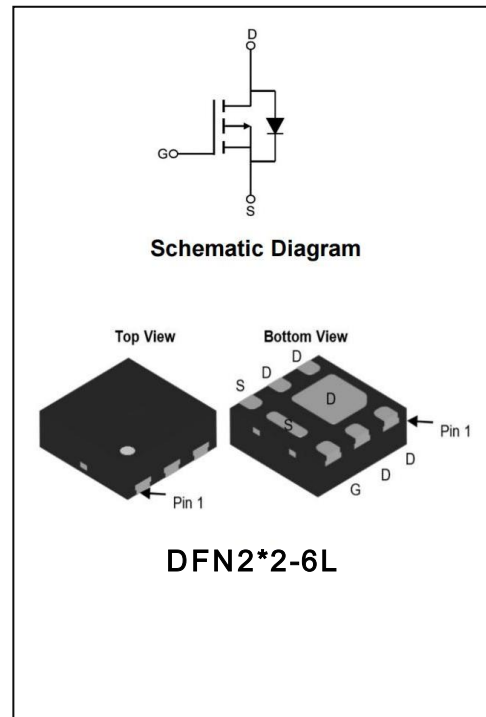
The Power MOSFET has extremely low on resistance, making it especially suitable for applications which require superior power density and outstanding efficiency.

Features

- ◆ $V_{DS} = -15V, I_D = -7A$
- ◆ $R_{DS(ON)}$
 TYP: $14m\Omega @ V_{GS} = -4.5V$
 TYP: $20m\Omega @ V_{GS} = -2.5V$

Applications

- ◆ Load Switch
- ◆ PWM Applications
- ◆ Power Management



ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SFR01507PT	DFN2*2	01507PT	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	V
Drain Current	T _C = 25°C	I _D	-7	A
	T _C = 75°C		-4.4	
Drain Current Pulsed(Note 1)		I _{DM}	-28	A
Power Dissipation(T _C =25°C) -Derate above 25°C		P _D	10.4	W
Single Pulsed Avalanche Energy (Note 2)		E _{AS}	15	mJ
Operation Junction Temperature Range		T _J	-55~+150	°C
Storage Temperature Range		T _{stg}	-55~+150	°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		TL	300	°C

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} = -20V, V _{GS} = 0V	--	--	1	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	-0.4	-0.7	-1.0	V
Static Drain- Source On State Resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -3.5A	--	14	18	mΩ
		V _{GS} = -2.5V, I _D = -2.0A	--	20	26	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = -10V V _{GS} = 0V f=1.0MHZ	--	837	--	pF
Output Capacitance	C _{oss}		--	126	--	
Reverse Transfer Capacitance	C _{riss}		--	81	--	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} = -10V, V _{GS} = -4.5V R _G = 1 Ω, I _D = -3.3A (Note 3.4)	--	10.3	--	nS
Turn-on Rise Time	t _r		--	31	--	
Turn-off Delay Time	t _{d(off)}		--	52	--	
Turn-off Fall Time	t _f		--	53	--	
Total Gate Charge	Q _g	V _{DS} =-10V, I _D =-2A V _{GS} =-4.5V (Note 3.4)	--	8.9	--	nC
Gate-Source Charge	Q _{gs}		--	1.4	--	
Gate-Drain Charge	Q _{gd}		--	1.9	--	

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	--	--	-7	A
Pulsed Source Current	I_{SM}		--	--	-28	
Diode Forward Voltage	V_{SD}	$I_S = -7A, V_{GS} = 0V$	--	-0.8	-1.2	V

NOTE:

1. Pulse width limited by maximum junction temperature
2. $L=0.5mH, V_{DD}=-10V, V_G=-10V, R_G=25\Omega$, starting $T_J=25^\circ C$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
4. Essentially independent of operating temperature

Typical Performance Characteristics

Figure 1: Output Characteristics

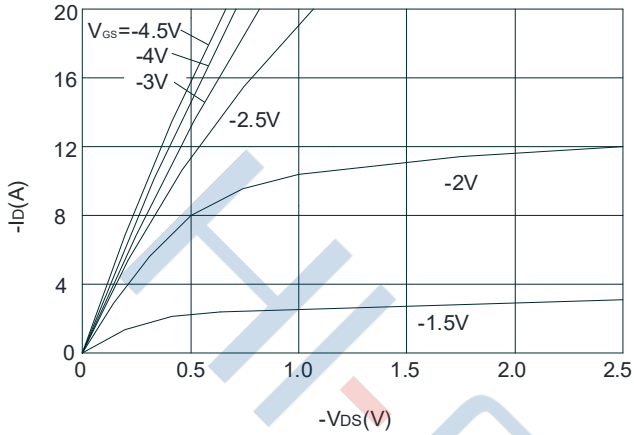


Figure 2: Typical Transfer Characteristics

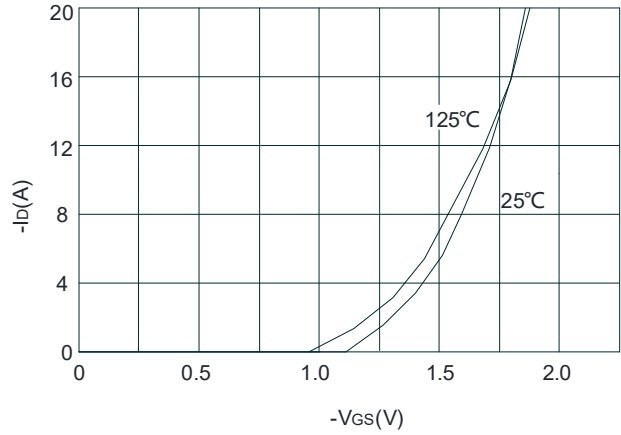


Figure 3: On-resistance vs. Drain Current

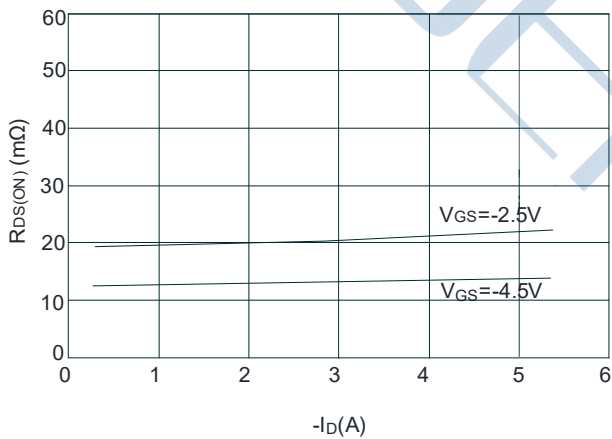


Figure 4: Body Diode Characteristics

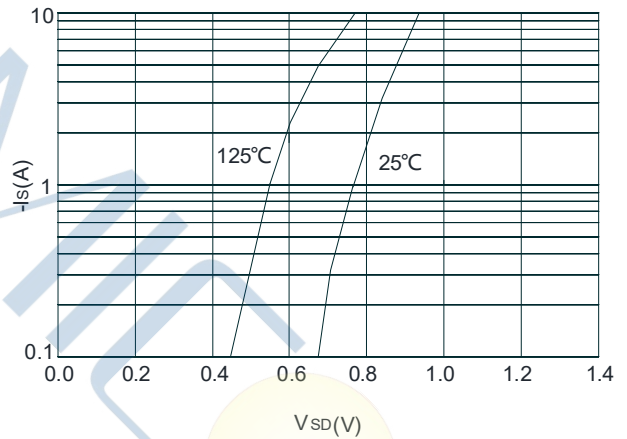


Figure 5: Capacitance Characteristics

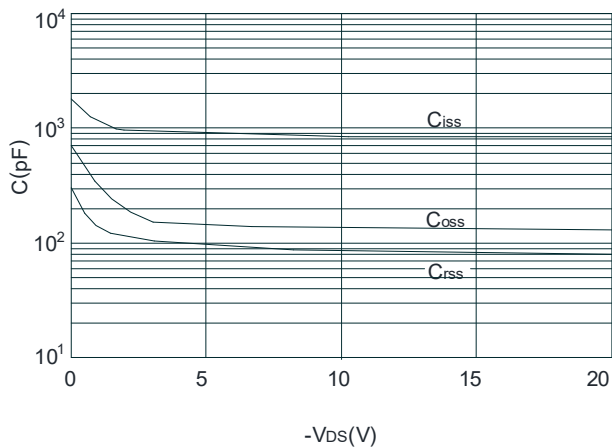
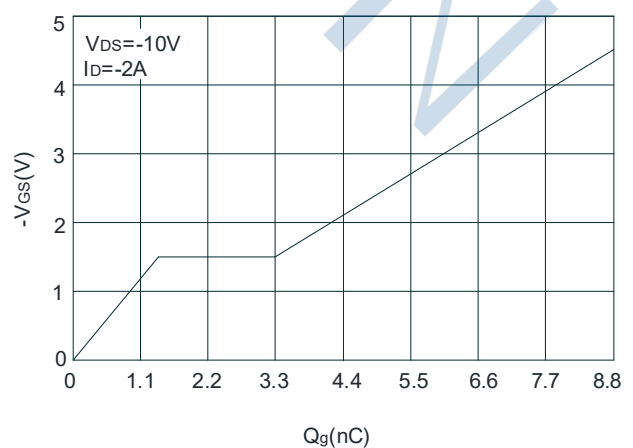


Figure 6: Gate Charge Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

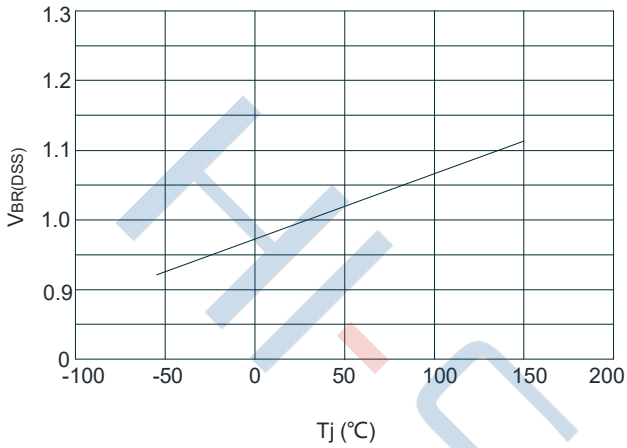


Figure 8: Normalized on Resistance vs. Junction Temperature

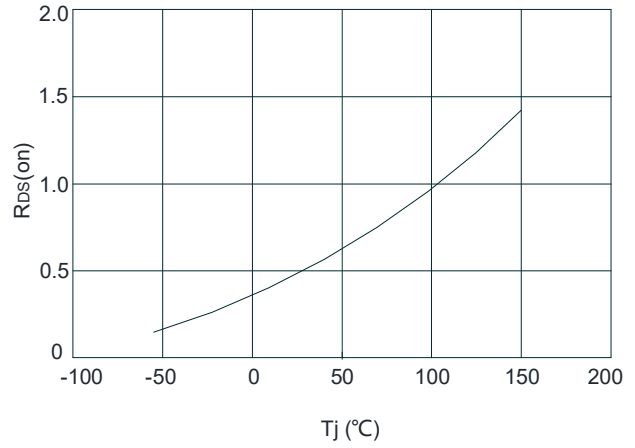


Figure 9: Maximum Safe Operating Area

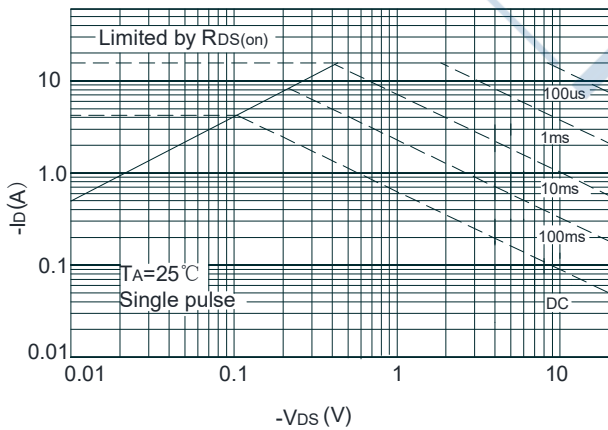
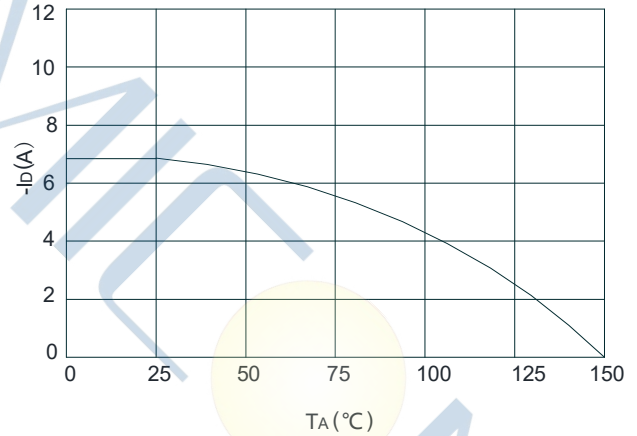
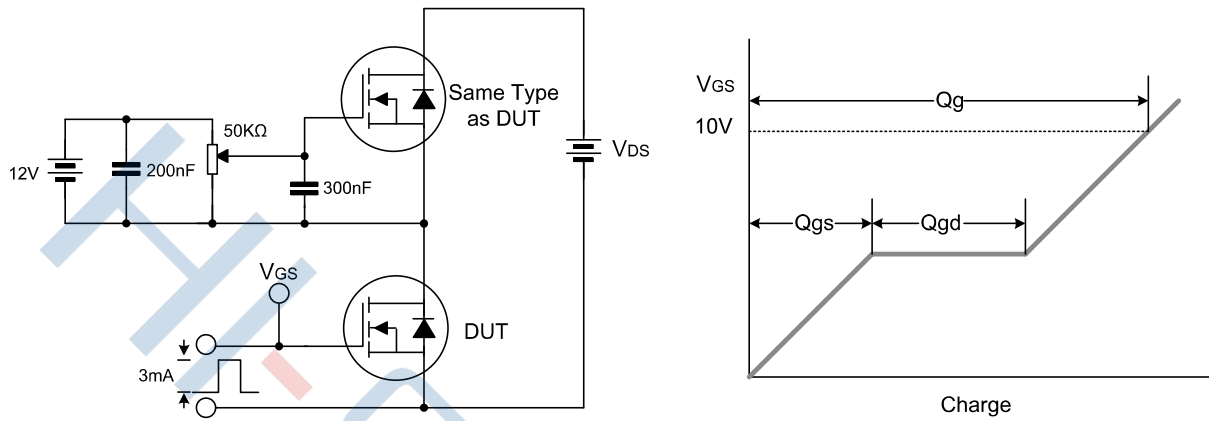


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

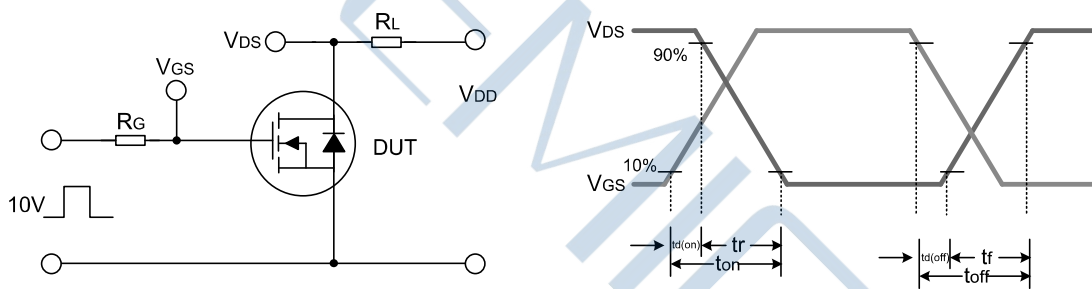


Test Circuit

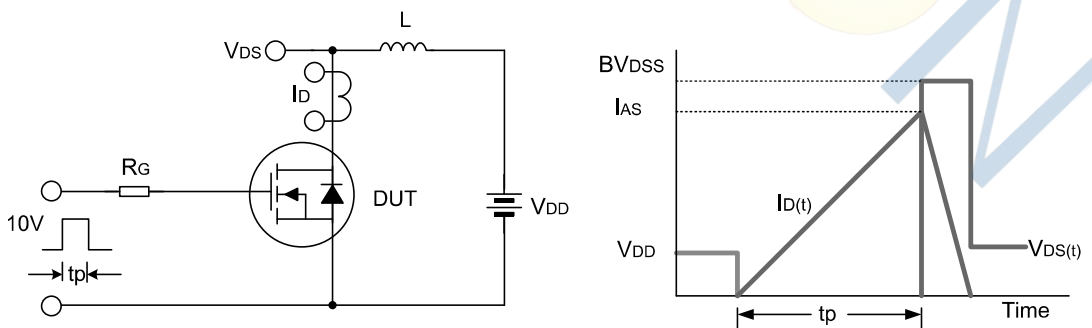
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform

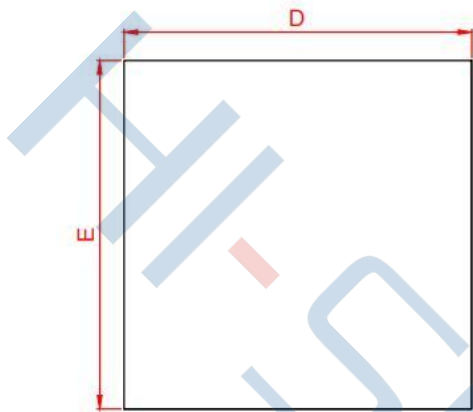


Unclamped Inductive Switching Test Circuit & Waveform

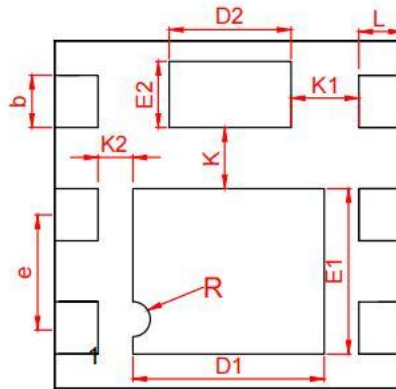


Package Dimensions of DFN2*2

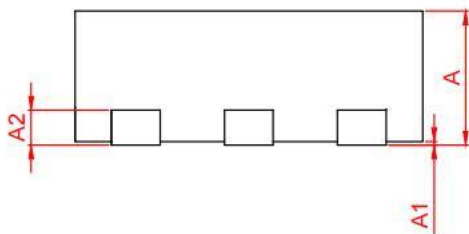
Unit:mm



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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