30V /70A Single N Power MOSFET

General Description

30V /70A Single N Power MOSFET

Very low on-resistance RDS(on) @ VGS=4.5 V

Pb-free lead plating; RoHS compliant

V_{DS}	30	V
$R_{DS(on),TYP}$@VGS=10V	3.5	mΩ
$R_{DS(on),TYP}$@VGS=4.5	5.5	mΩ
I_D	70	A

Top View   **Bottom View**

← PIN1

Top View
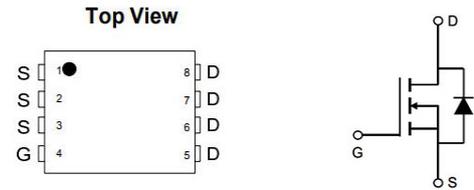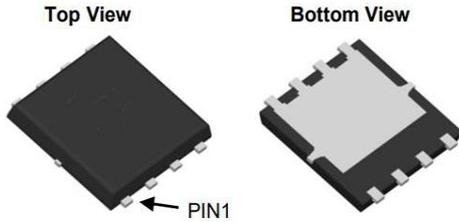
Part ID	Package Type	Marking	Tape and reel infomation		
SM6796D1RL	DFN5x6	6796	3000		100% UIS Tested 100% Rg Tested

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	12	±V
Continuous Drain Current A	TA=25°C	I_D	70.0	A
	TA=70°C		46*	
Pulsed Drain Current B		I_{DM}	112.0	
Avalanche Current G		I_{AR}	22.4	
Repetitive avalanche energy L=0.1mH G		E_{AR}	51.5	mJ
Power Dissipation A	TA=25°C	P_D	31	W
	TA=70°C		13*	
Junction and Storage Temperature Range		T_J, T_{STG}	−55 to 150	°C

Thermal Characteristics

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient A	t ≤ 10s	$R_{θJA}$	12	18	°C/W
Maximum Junction-to-Ambient A	Steady State		25	30	°C/W
Maximum Junction-to-Lead C	Steady State	$R_{θJL}$	7	12	°C/W

STATIC PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	I_D = -250uA, V_{GS} = 0V	30			V
I_{DSS}	Zero Gate Voltage Drain Current	VDS=30V, VGS=0V			1	uA
					5	
I_{GSS}	Gate-Body leakage current	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS} I_D = 250µA	1	1.4	1.9	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	VGS=10V, ID=20A		3.5	5.0	mΩ
		VGS=4.5V, ID=20A		5.5	7.2	
g_{FS}	Forward Transconductance	VDS=5V, ID=20A		82		S
V_{SD}	Diode Forward Voltage	IS=1A,VGS=197V		0.72	1	V
I_S	Maximum Body-Diode Continuous Current				70	A

DYNAMIC PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
C_{iss}	Input Capacitance	VGS=0V, VDS=15V, f=1MHz		1350	1647	pF
C_{oss}	Output Capacitance			450	553	pF
C_{rss}	Reverse Transfer Capacitance			60	71	pF
R_g	Gate resistance	VGS=0V, VDS=0V, f=1MHz			1.5	Ω

SWITCHING PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Q_g (10V)	Total Gate Charge	VGS=10V, VDS=15V, ID=20A		10.5		nC
Q_g 4.5V)	Total Gate Charge			5.25		
Q_{gs}	Gate Source Charge			2.1		
Q_{gd}	Gate Drain Charge			3		
$t_{D(on)}$	Turn-On DelayTime	VGS=10V, VDS=15V,RL=0.75Ω, RGEN=3Ω		6.5		ns
t_r	Turn-On Rise Time			5.2		
$t_{D(off)}$	Turn-Off DelayTime			18.2		
t_f	Turn-Off Fall Time			5.85		
t_{rr}	Body Diode Reverse Recovery Time	IF=-8A, dI/dt=500A/µs		13		ns
Q_{rr}	Body Diode Reverse Recovery Charge	IF=18A, dI/dt=500A/µs		22		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS
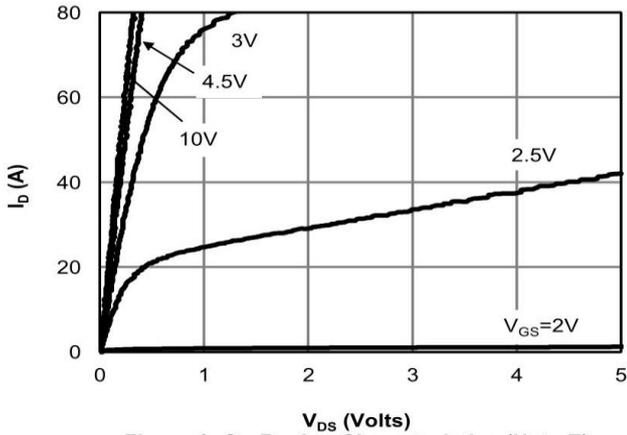
Figure 1: On-Region Characteristics (Note E)
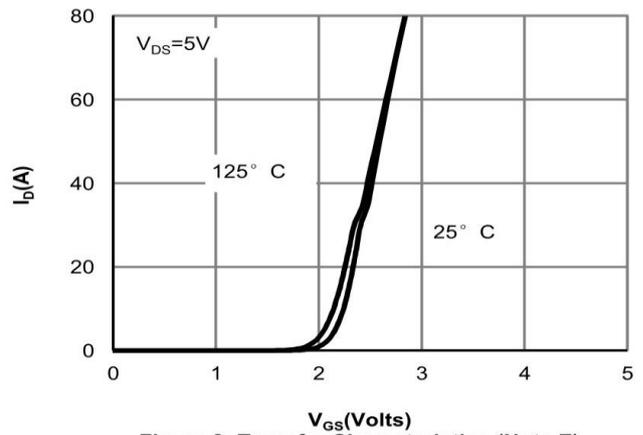
Figure 2: Transfer Characteristics (Note E)
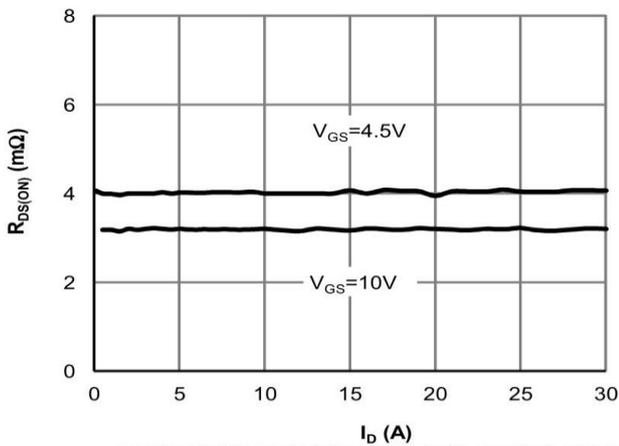
Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)
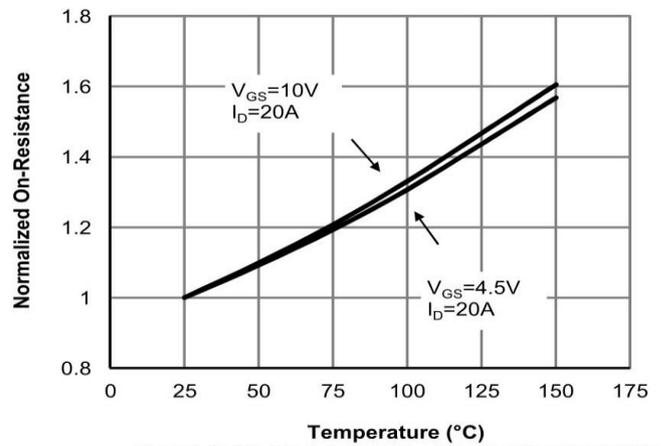
Figure 4: On-Resistance vs. Junction Temperature (Note E)
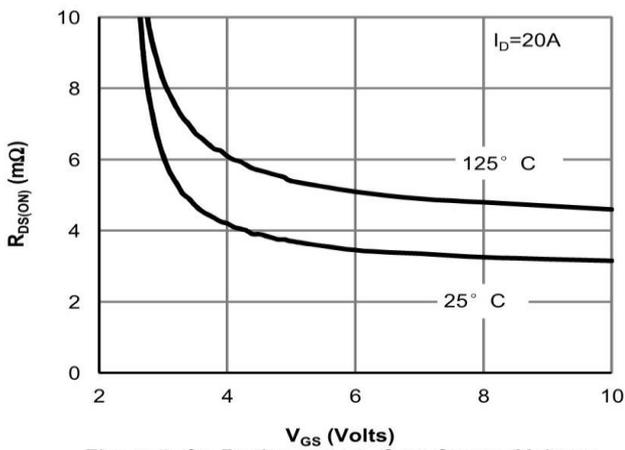
Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)
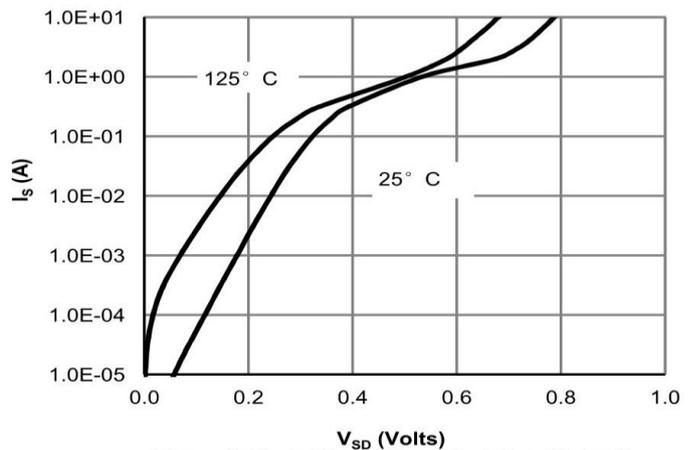
Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS
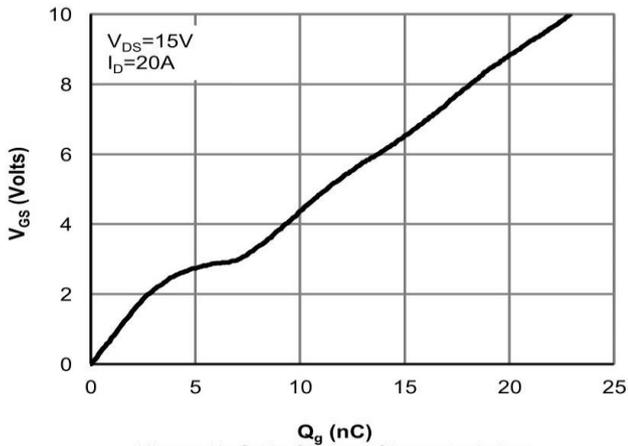

Figure 7: Gate-Charge Characteristics
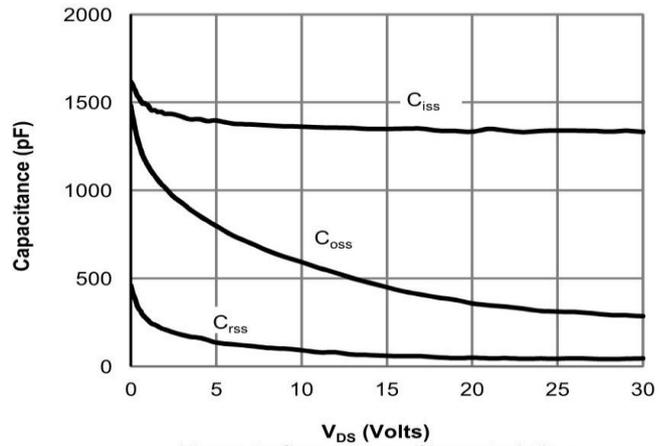
Figure 8: Capacitance Characteristics
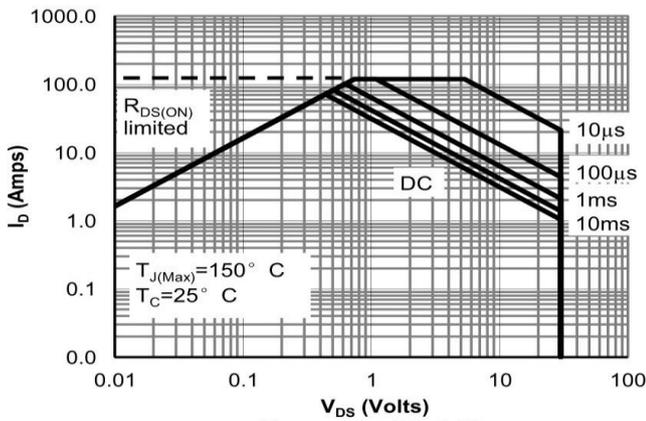

$V_{GS}>$ or equal to 4.5V
**Figure 9: Maximum Forward Biased Safe Operating Area (Note F)**
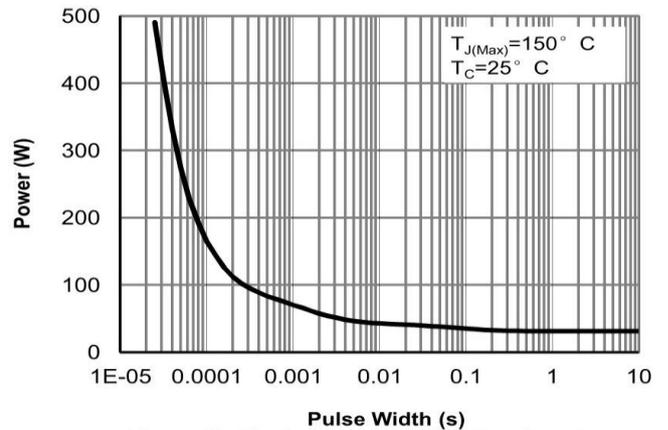
**Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)**
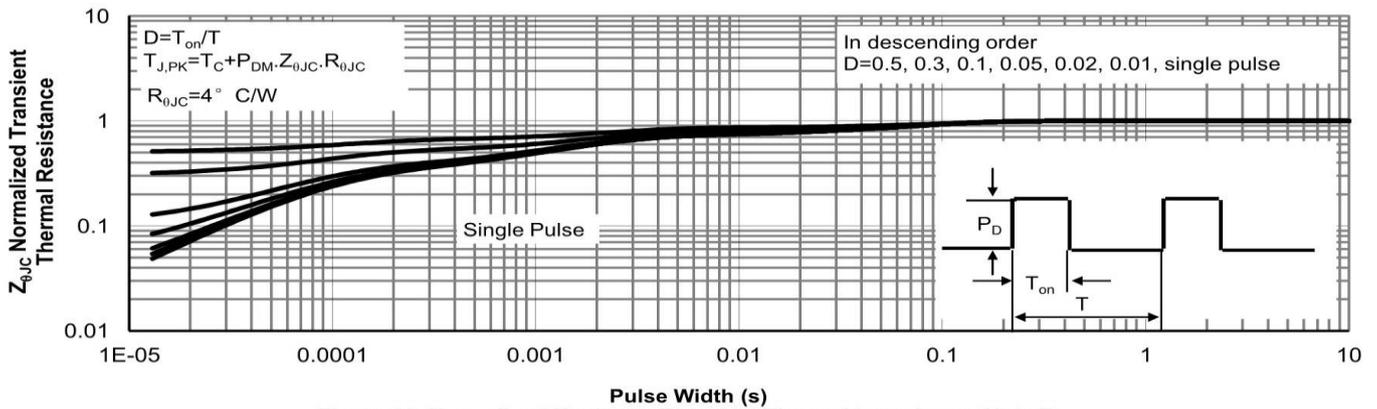
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

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