MegaPower Semiconductor

Si2366DS

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[a]	Q_g (Typ.)
30	0.036 at V_{GS} = 10 V	5.8	3.2 nC
	0.042 at V_{GS} = 4.5 V	5.4	

FEATURES

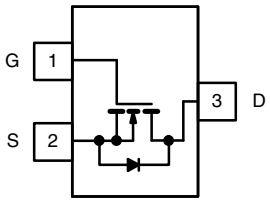
- **Halogen-free According to IEC 61249-2-21 Definition**
- TrenchFET® Power MOSFET
- 100 % R_g Tested
- Compliant to RoHS Directive 2002/95/EC

Pb-free
RoHS COMPLIANT
HALOGEN FREE

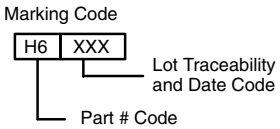
APPLICATIONS

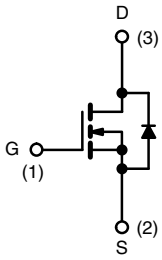
- DC/DC Converters, High Frequency Switching
- Load Switch

SOT-23



Top View





N-Channel MOSFET

Ordering Information: Si2366DS-T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	5.8[a]	A
	T_C = 70 °C		4.7	
	T_A = 25 °C		4.5[b, c]	
	T_A = 70 °C		3.6[b, c]	
Pulsed Drain Current (t = 300 µs)		I_{DM}	20	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	1.75	
	T_A = 25 °C		1.04[b, c]	
Maximum Power Dissipation	T_C = 25 °C	P_D	2.1	W
	T_C = 70 °C		1.3	
	T_A = 25 °C		1.25[b, c]	
	T_A = 70 °C		0.8[b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature)			260	

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[b, d]	t ≤ 5 s	R_{thJA}	80	100	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	40	60	

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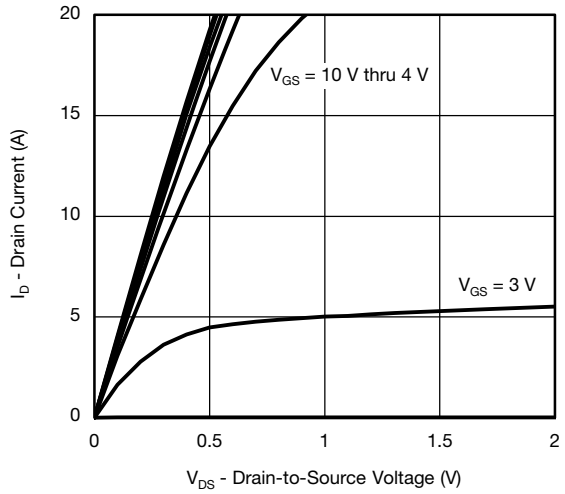
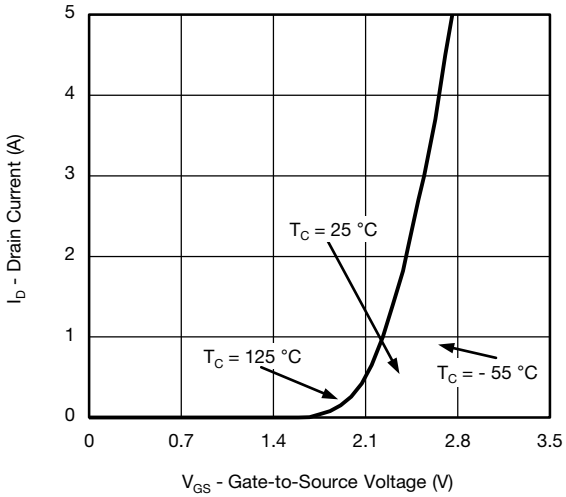
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = 250 µA		33		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 5.5		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250 µA	1.2		2.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V			1	µA
		V_{DS} = 30 V, V_{GS} = 0 V, T_J = 70 °C			10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ 5 V, V_{GS} = 10 V	20			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 4.5 A		0.030	0.036	Ω
		V_{GS} = 4.5 V, I_D = 4.2 A		0.035	0.042	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 4.5 A		13		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz		335		pF
Output Capacitance	C_{oss}			78		
Reverse Transfer Capacitance	C_{rss}			30		
Total Gate Charge	Q_g	V_{DS} = 15 V, V_{GS} = 10 V, I_D = 4.5 A		6.4	10	nC
		V_{DS} = 15 V, V_{GS} = 4.5 V, I_D = 4.5 A		3.2	5	
Gate-Source Charge	Q_{gs}			1.1		
Gate-Drain Charge	Q_{gd}			1.3		
Gate Resistance	R_g	f = 1 MHz	0.7	3.5	7	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15 V, R_L = 4.2 Ω $I_D \cong$ 3.5 A, V_{GEN} = 4.5 V, R_g = 1 Ω		32	48	ns
Rise Time	t_r			48	71	
Turn-Off Delay Time	$t_{d(off)}$			18	27	
Fall Time	t_f			20	30	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15 V, R_L = 4.2 Ω $I_D \cong$ 3.6 A, V_{GEN} = 10 V, R_g = 1 Ω		5	10	
Rise Time	t_r			12	20	
Turn-Off Delay Time	$t_{d(off)}$			14	21	
Fall Time	t_f			8	16	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			1.75	A
Pulse Diode Forward Current	I_{SM}				20	
Body Diode Voltage	V_{SD}	I_S = 3.6 A, V_{GS} = 0 V		0.85	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 3.6 A, dI/dt = 100 A/µs, T_J = 25 °C		12	18	ns
Body Diode Reverse Recovery Charge	Q_{rr}			5	10	nC
Reverse Recovery Fall Time	t_a			7		ns
Reverse Recovery Rise Time	t_b			5		

Notes:

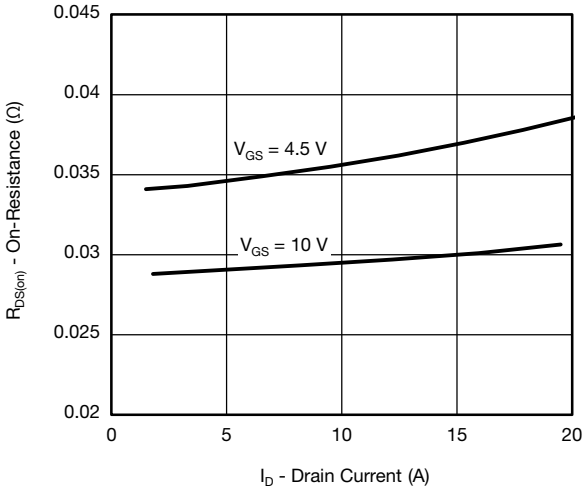
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



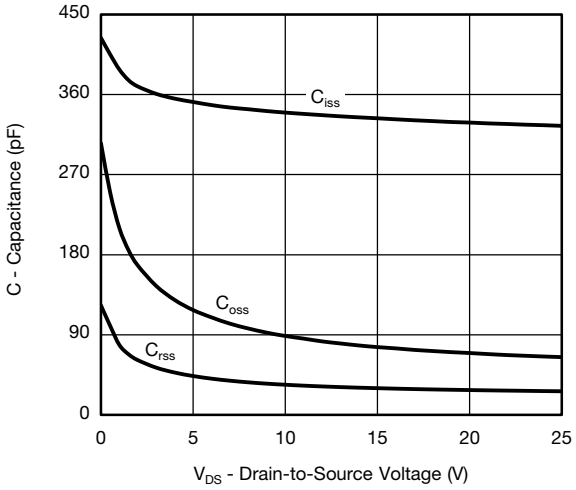
Output Characteristics



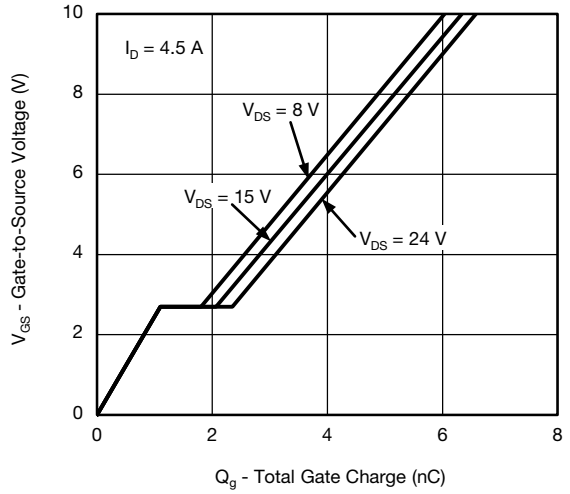
Transfer Characteristics



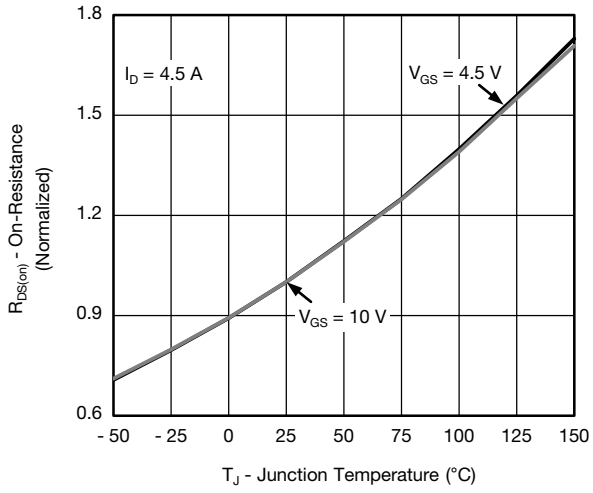
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge



On-Resistance vs. Junction Temperature