

Dual P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
- 30	0.021 at $V_{GS} = -10$ V	- 8.3
	0.031 at $V_{GS} = -4.5$ V	- 6.8

FEATURES

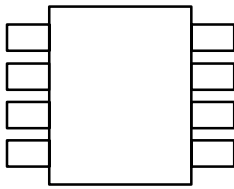
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFET
- Compliant to RoHS Directive 2002/95/EC



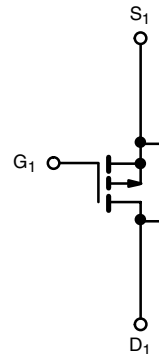
RoHS
COMPLIANT
HALOGEN
FREE
Available

APPLICATIONS

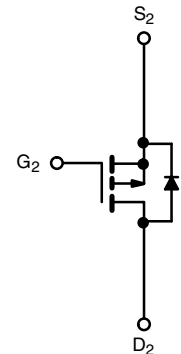
- Load Switches
 - Notebook PCs
 - Desktop PCs
 - Game Stations
- Battery Switch



Ordering Information: Si4923DY-T1-E3 (Lead (Pb)-free)
Si4923DY-T1-GE3 (Lead (Pb)-free and Halogen-free)



P-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ\text{C}$, unless otherwise noted

Parameter		Symbol	10 s	Steady State	Unit
Drain-Source Voltage		V _{DS}	- 30		V
Gate-Source Voltage		V _{GS}	± 20		
Continuous Drain Current (T _J = 150 °C) ^a	T _A = 25 °C	I _D	- 8.3	- 6.2	A
	T _A = 70 °C		- 6.6	- 5.0	
Pulsed Drain Current		I _{DM}	- 30		
Continuous Source Current (Diode Conduction) ^a		I _S	- 1.7	- 0.9	
Maximum Power Dissipation ^a	T _A = 25 °C	P _D	2.0	1.1	W
	T _A = 70 °C		1.3	0.7	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 150		°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	R_{thJA}	45	62.5	$^\circ\text{C/W}$
		85	110	
Maximum Junction-to-Foot (Drain)	R_{thJF}	26	35	

Notes:

a. Surface Mounted on 1" x 1" FR4 board.

SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250\text{ }\mu\text{A}$	- 1		- 3	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30\text{ V}$, $V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -30\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55\text{ }^{\circ}\text{C}$			- 25	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5\text{ V}$, $V_{GS} = -10\text{ V}$	- 30			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}$, $I_D = -8.3\text{ A}$		0.017	0.021	Ω
		$V_{GS} = -4.5\text{ V}$, $I_D = -6.8\text{ A}$		0.025	0.031	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10\text{ V}$, $I_D = -8.3\text{ A}$		26		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.7\text{ A}$, $V_{GS} = 0\text{ V}$		- 0.8	- 1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -15\text{ V}$, $V_{GS} = -10\text{ V}$, $I_D = -8.3\text{ A}$		45.5	70	nC
Gate-Source Charge	Q_{gs}			6.5		
Gate-Drain Charge	Q_{gd}			12.6		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}$, $R_L = 15\text{ }\Omega$ $I_D \equiv -1\text{ A}$, $V_{GEN} = -10\text{ V}$, $R_g = 6\text{ }\Omega$		15	25	ns
Rise Time	t_r			10	15	
Turn-Off Delay Time	$t_{d(off)}$			135	210	
Fall Time	t_f			80	120	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -1.7\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		70	110	

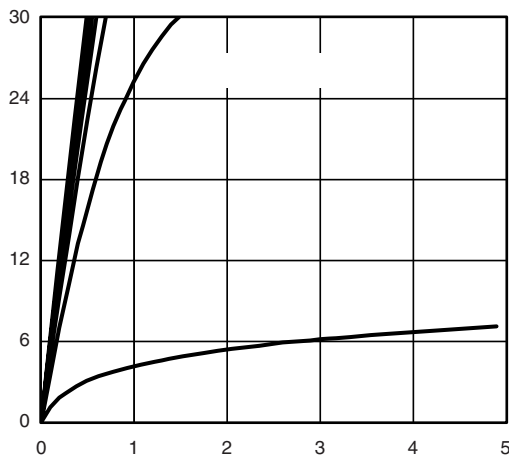
Notes:

a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

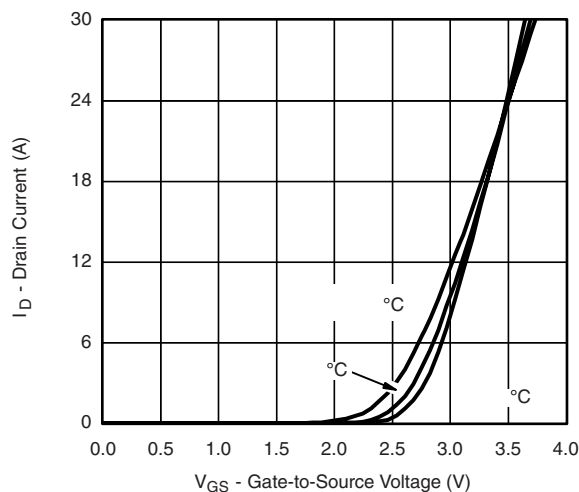
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS $25\text{ }^{\circ}\text{C}$, unless otherwise noted



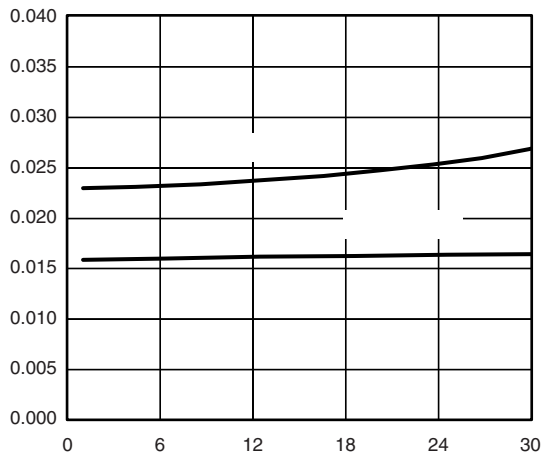
Output Characteristics



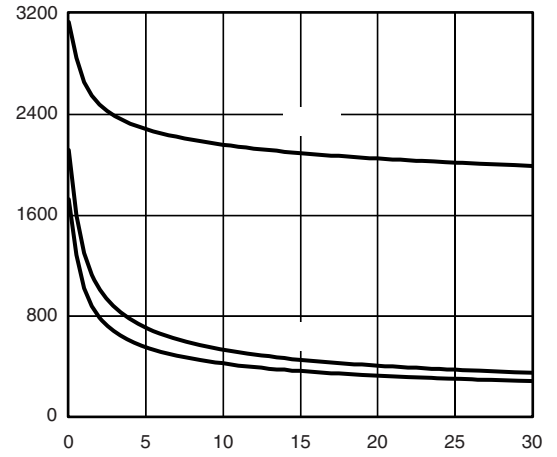
Transfer Characteristics



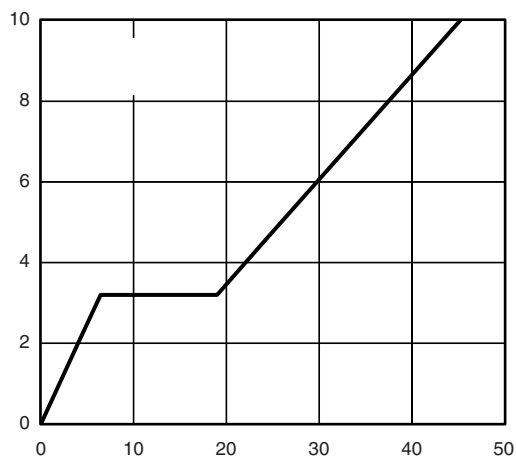
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



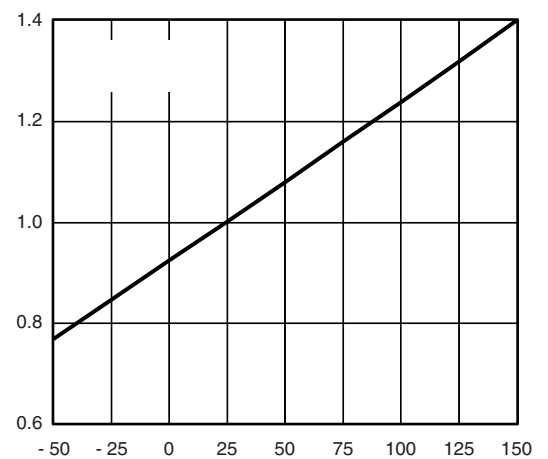
I_D - Drain Current (A)
On-Resistance vs. Drain Current



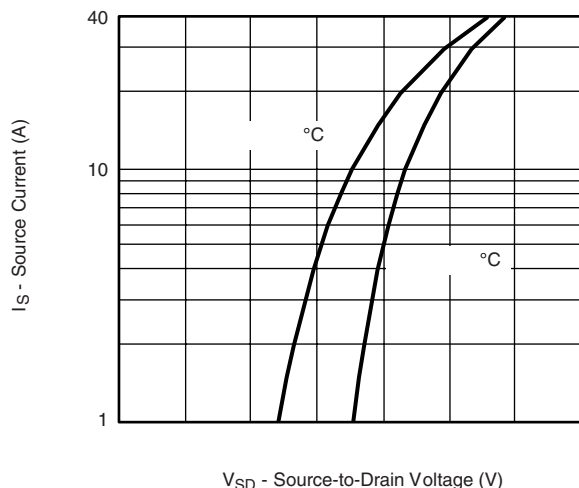
V_{DS} - Drain-to-Source Voltage (V)
Capacitance



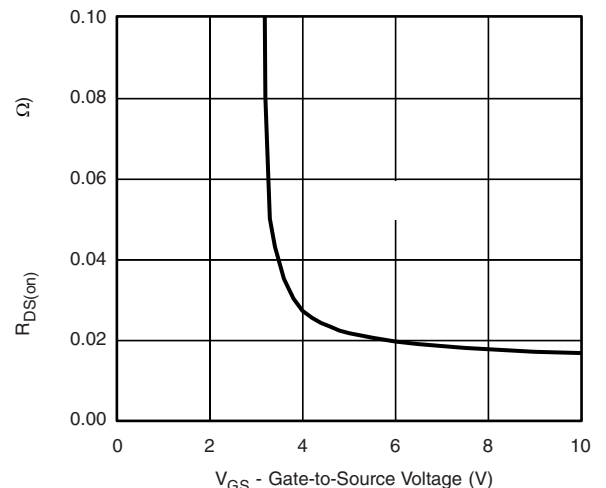
Gate Charge



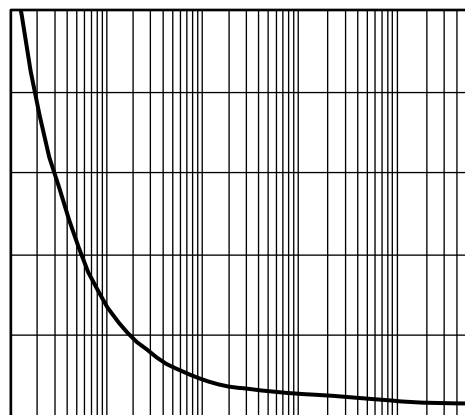
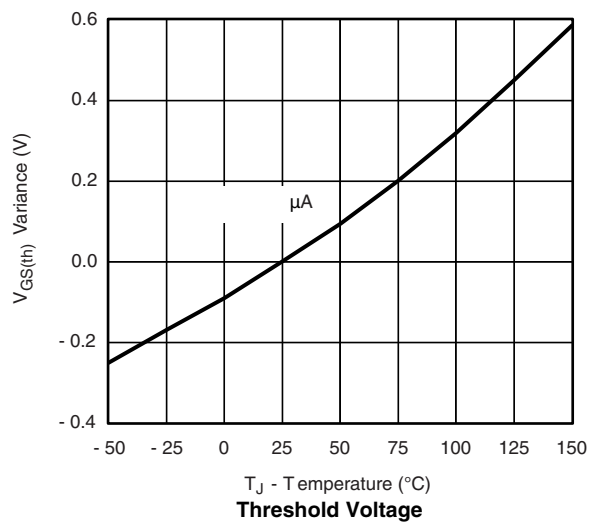
On-Resistance vs. Junction Temperature



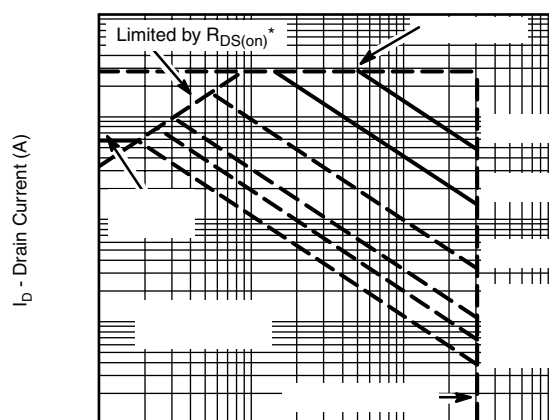
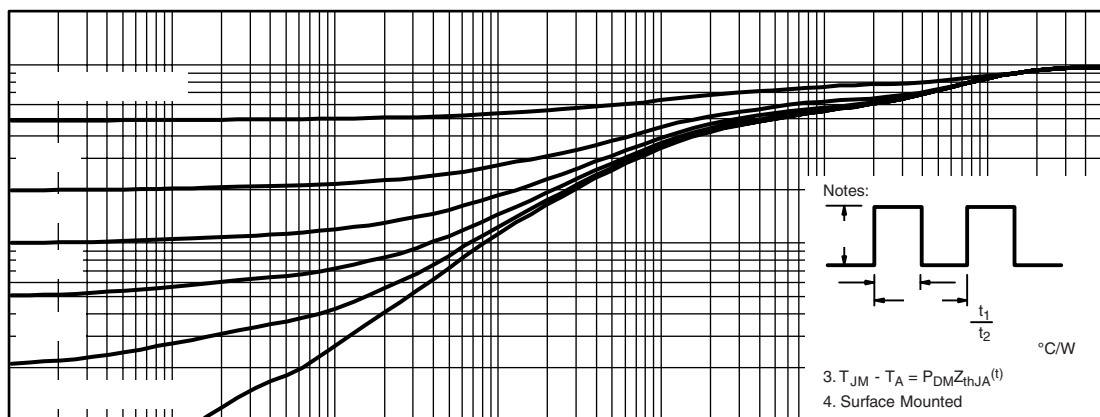
V_{SD} - Source-to-Drain Voltage (V)
Source-Drain Diode Forward Voltage



V_{GS} - Gate-to-Source Voltage (V)
On-Resistance vs. Gate-to-Source Voltage

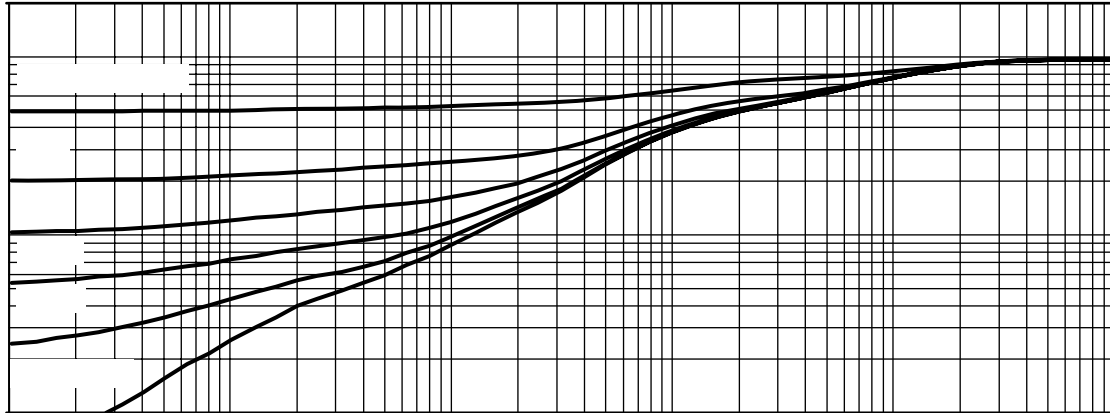
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

Single Pulse Power

 V_{DS} - Drain-to-Source Voltage (V)* $V_{DS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified**Safe Operating Area, Junction-to-Ambient****Normalized Thermal Transient Impedance, Junction-to-Ambient**



TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Foot

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