



# P-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY				
V <sub>DS</sub> (V)	$R_{DS(on)}\left(\Omega\right)$	I <sub>D</sub> (A)		
- 20	$0.080 \text{ at V}_{GS} = -10 \text{ V}$	- 4.0		
	0.170 at V <sub>GS</sub> = - 4.5 V	- 2.7		

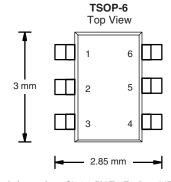
#### **FEATURES**

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

# Pb-free RoHS COMPLIANT HALOGEN FREE

#### **APPLICATIONS**

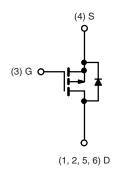
- Load Switch
  - Notebook PC
  - Game Machine



Ordering Information: Si3465DV-T1-E3 (Lead (Pb)-free)

Si3465DV-T1-GE3 (Lead (Pb)-free and Halogen-free)

Marking Code: 5C



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T <sub>A</sub> = 25 °C, unless otherwise noted						
Parameter		Symbol	5 s	Steady State	Unit	
Drain-Source Voltage		V <sub>DS</sub>	- 20		V	
Gate-Source Voltage		V <sub>GS</sub>	± 20			
Continuous Drain Current /T 150 °C\2	T <sub>A</sub> = 25 °C	- I <sub>D</sub>	- 4.0	- 3.0	_	
Continuous Drain Current (T <sub>J</sub> = 150 °C) <sup>a</sup>	T <sub>A</sub> = 70 °C		- 3.2	- 2.4		
Pulsed Drain Current		I <sub>DM</sub>	- 20		Α Α	
Continuous Source Current (Diode Conduction) <sup>a</sup>		I <sub>S</sub>	- 1.7	- 0.95		
Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> = 25 °C	- P <sub>D</sub>	2.0	1.14	- W	
	T <sub>A</sub> = 70 °C		1.3	0.73		
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	- 55 to 150		°C	

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Typical	Maximum	Unit	
Mariana haratina ta Ambinata	t ≤ 5 s	R <sub>thJA</sub>	52	62.5	°C/W	
Maximum Junction-to-Ambient <sup>a</sup>	Steady State		92	110		
Maximum Junction-to-Foot (Drain)	Steady State	$R_{thJF}$	34	41		

#### Notes:

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

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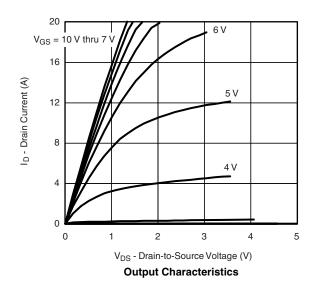
Parameter	Symbol	I Test Conditions		Тур.	Max.	Unit	
Static			1	•			
Gate Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	- 1.0		- 3	V	
Gate-Body Leakage	I <sub>GSS</sub>	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
Zero Gate Voltage Drain Current		V <sub>DS</sub> = - 20 V, V <sub>GS</sub> = 0 V			- 1		
	I <sub>DSS</sub>	V <sub>DS</sub> = - 20 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C			- 10	μΑ	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	$V_{DS} \le -5 \text{ V}, V_{GS} = -10 \text{ V}$	- 20			Α	
Drain-Source On-State Resistance <sup>a</sup>	В	V <sub>GS</sub> = - 10 V, I <sub>D</sub> = - 4 A	0.065 0		0.080		
	R <sub>DS(on)</sub>	V <sub>GS</sub> = - 4.5 V, I <sub>D</sub> = - 2.7 A		0.140	0.170	Ω	
Forward Transconductance <sup>a</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = - 15 V, I <sub>D</sub> = - 4 A		6		S	
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	I <sub>S</sub> = - 1.7 A, V <sub>GS</sub> = 0 V		- 0.8	- 1.2	٧	
Dynamic <sup>b</sup>				1			
Total Gate Charge	$Q_g$			3.5	5.5		
Gate-Source Charge	$Q_{gs}$	$V_{DS} = -10 \text{ V}, V_{GS} = -5 \text{ V}, I_{D} = -4 \text{ A}$		1.3		nC	
Gate-Drain Charge	$Q_{gd}$			1.4		1	
Gate Resistance	$R_{g}$	f = 1 MHz		9.5		Ω	
Turn-On Delay Time	t <sub>d(on)</sub>			9	15		
Rise Time	t <sub>r</sub>	$V_{DD} = -10 \text{ V}, R_{L} = 10 \Omega$		13	20		
Turn-Off Delay Time	t <sub>d(off)</sub>	$I_D \cong$ - 1 A, $V_{GEN}$ = - 10 V, $R_g$ = 6 $\Omega$		19	30	ns	
Fall Time	t <sub>f</sub>			8	15		
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = - 1.7 A, dI/dt = 100 A/μs		20	40		

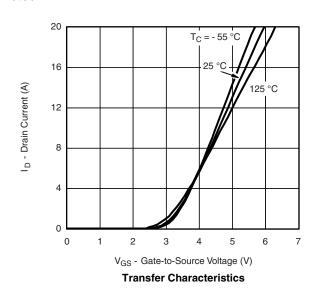
#### Notes:

- a. Pulse test; pulse width  $\leq$  300  $\mu$ 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 °C, unless otherwise noted



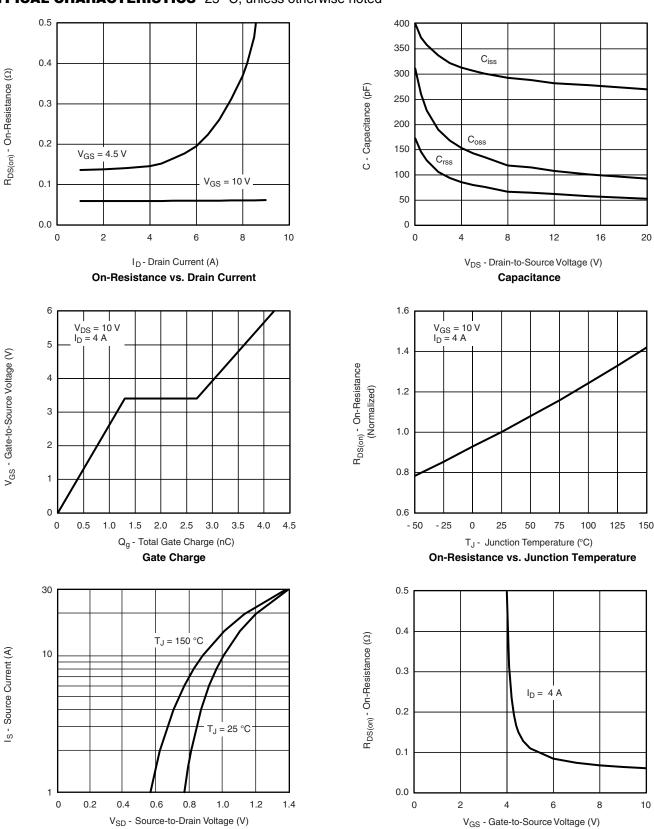








#### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



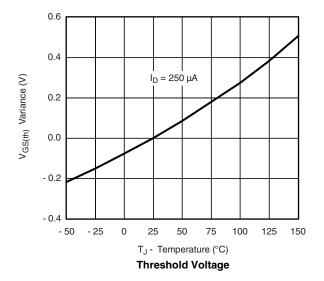
Source-Drain Diode Forward Voltage

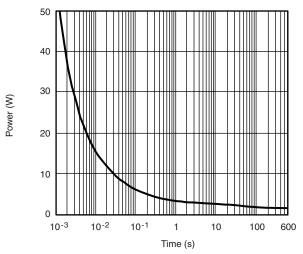
On-Resistance vs. Gate-to-Source Voltage

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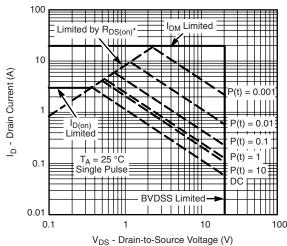
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#### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



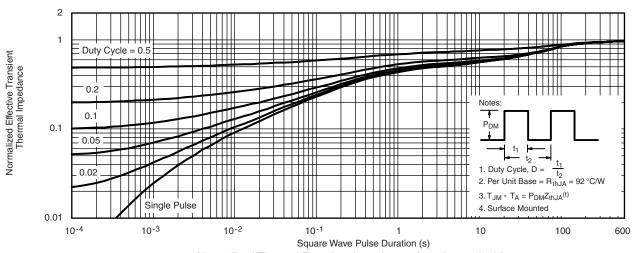


Single Pulse Power



\*  $V_{GS}$  > minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified

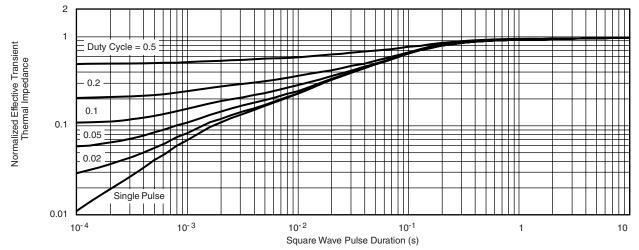
#### Safe Operating Area



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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