

P-Channel 12-V (D-S) MOSFET

PRODUCT SUMMARY					
V _{DS} (V)	$R_{DS(on)}\left(\Omega\right)$ I_{D}				
	0.0050 at V _{GS} = - 4.5 V	- 16			
- 12	0.0065 at V _{GS} = - 2.5 V	- 15			
	0.0100 at V _{GS} = - 1.8 V	- 13			

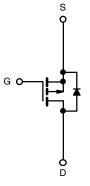
FEATURES

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

Pb-free RoHS COMPLIANT HALOGEN FREE

APPLICATIONS

- · Load Switch
- · Battery Switch



P-Channel MOSFET

	SO-8		
S 1		8	D
S 2		7	D
S 3		6	D
G 4		5	D
	Top View	_	

ABSOLUTE MAXIMUM RATINGS	T _A = 25 °C, unle	ss otherwise n	oted			
Parameter		Symbol	10 s	Steady State	Unit	
Drain-Source Voltage		V _{DS}	- 12		V	
Gate-Source Voltage		V _{GS}	± 8			
Continuous Dunin Comment /T 450 90\8	T _A = 25 °C	- I _D	- 16	- 10	^	
Continuous Drain Current (T _J = 150 °C) ^a	T _A = 70 °C		- 11.5	- 8		
Pulsed Drain Current		I _{DM}	- 50		Α	
Continuous Source Current (Diode Conduction) ^a		I _S	- 2.7	- 1.36		
M	T _A = 25 °C	В	3.0	1.5	W	
Maximum Power Dissipation ^a	T _A = 70 °C	P _D 1.9		0.95	VV	
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	t ≤ 10 s	D	33	42		
	Steady State	- R _{thJA}	70	84	°C/W	
Maximum Junction-to-Foot (Drain)	Steady State	R _{thJF}	16	21		

Notes:

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

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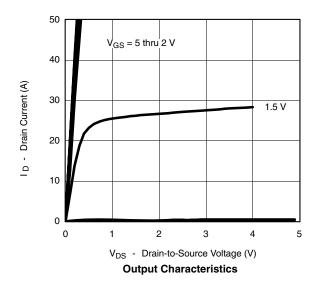
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static			•				
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = -600 \mu\text{A}$ - 0.5 - 1.0		1.0	V		
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 8 \text{ V}$	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 8 \text{ V}$ ± 100		± 100	nA	
Zara Cata Valtaga Drain Current	I _{DSS}	V _{DS} = - 12 V, V _{GS} = 0 V			- 1	μΑ	
Zero Gate Voltage Drain Current		V _{DS} = - 12 V, V _{GS} = 0 V, T _J = 70 °C			- 10		
On-State Drain Current ^a	I _{D(on)}	V _{DS} = - 5 V, V _{GS} = - 4.5 V	- 30			Α	
	R _{DS(on)}	V _{GS} = - 4.5 V, I _D = - 14 A		0.0050			
Drain-Source On-State Resistance ^a		V _{GS} = - 2.5 V, I _D = - 13 A		0.0065		Ω	
		V _{GS} = - 1.8 V, I _D = - 12 A		0.0100			
Forward Transconductance ^a	9 _{fs}	V _{DS} = - 6 V, I _D = - 14 A 80			S		
Diode Forward Voltage ^a	V_{SD}	I _S = - 2.7 A, V _{GS} = 0 V	I _S = - 2.7 A, V _{GS} = 0 V - 0.6		- 1.1	V	
Dynamic ^b							
Total Gate Charge	Q_g			110	165		
Gate-Source Charge	Q _{gs}	$V_{DS} = -6 \text{ V}, V_{GS} = -5 \text{ V}, I_{D} = -14 \text{ A}$		15		nC	
Gate-Drain Charge	Q _{gd}			27.5			
Turn-On Delay Time	t _{d(on)}			110	170		
Rise Time	t _r	V_{DD} = - 6 V, R_L = 6 Ω		235	350		
Turn-Off Delay Time	t _{d(off)}	$\text{I}_{\text{D}}\cong$ - 1 A, V_{GEN} = - 4.5 V, R_{g} = 6 Ω		410	620	ns	
Fall Time	t _f			285	430		
Gate Resistance	R_{g}			3.6		Ω	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = - 2.1 A, dl/dt = 100 A/μs		180	270	ns	

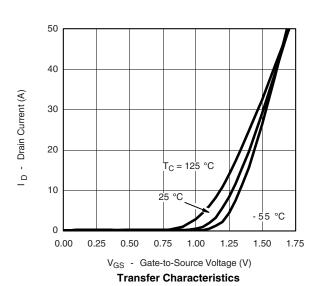
Notes:

- 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

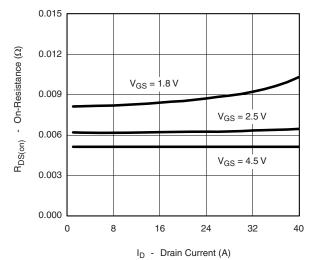




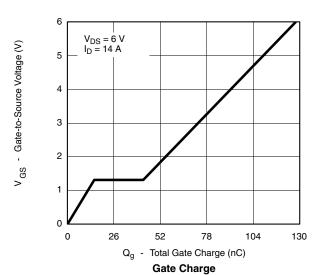
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TYPICAL CHARACTERISTICS 25 °C unless otherwise noted



On-Resistance vs. Drain Current



T_J = 150 °C

T_J = 150 °C

T_J = 25 °C

T_J = 25 °C

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

Source-Drain Diode Forward Voltage

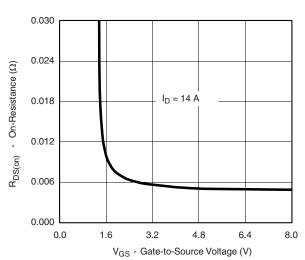
12000 10000 C - Capacitance (pF) 8000 6000 Coss 4000 $\mathsf{C}_{\mathsf{rss}}$ 2000 0 0 2 4 6 8 10 12 V_{DS} - Drain-to-Source Voltage (V)

Capacitance

1.6 $V_{GS} = 4.5 V$ $I_{D} = 14 \text{ A}$ 1.4 R_{DS(on)} - On-Resistance (Normalized) 1.2 1.0 0.8 0.6 - 50 - 25 0 75 100 125

T_J - Junction Temperature (°C)

On-Resistance vs. Junction Temperature



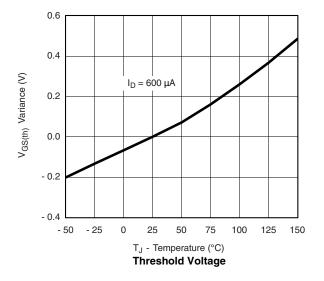
On-Resistance vs. Gate-to-Source Voltage

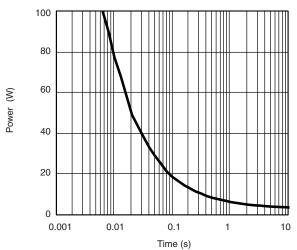
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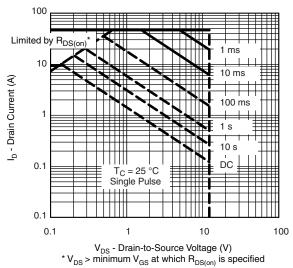


TYPICAL CHARACTERISTICS 25 °C unless otherwise noted

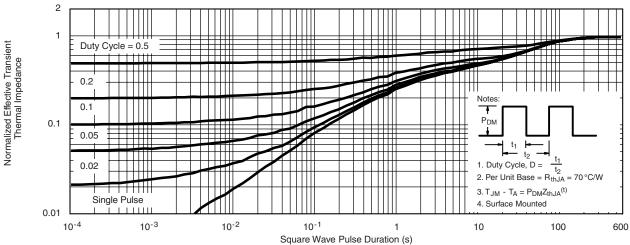




Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Case

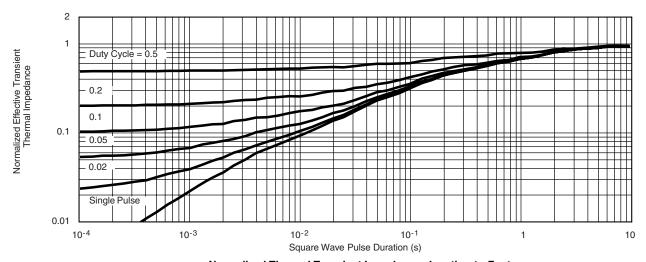


Normalized Thermal Transient Impedance, Junction-to-Ambient

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TYPICAL CHARACTERISTICS 25 °C unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Foot

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