



P-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY					
V _{DS} (V)	$R_{DS(on)}(\Omega)$ Max.	I _D (A)	Q _g (Typ.)		
- 100	0.042 at $V_{GS} = -10 \text{ V}$	- 36	54		
	0.047 at $V_{GS} = -4.5 \text{ V}$	- 29	54		

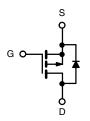
FEATURES

- TrenchFET® Power MOSFET
- 100 % R_q and UIS Tested
- Compliant to RoHS Directive 2002/95/EC



APPLICATIONS

- · Load Switch
- ORing



P-Channel MOSFET

TO-263					
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		\Box			
H	Ц	H			
G	D	S			
Top View					

Ordering Information: SUM50P10-42-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS	$T_C = 25 ^{\circ}C$, unless oth	nerwise noted)		
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	-100	V	
Gate-Source Voltage	V _{GS}	± 20	v	
Continuous Drain Current (T _{.I} = 150 °C)	T _C = 25 °C	1-	- 36	
Continuous Diain Current (1) = 130 C)	T _C = 70 °C	l _D	- 30	
Pulsed Drain Current (t = 300 μs)	I _{DM}	- 40	A	
Avalanche Current	I _{AS}	- 40		
Single Avalanche Energy ^a	L = 0.1 mH	E _{AS}	80	mJ
	T _C = 25 °C		125 ^b	14/
Maximum Power Dissipation ^a	T _A = 25 °C ^c	$ P_D$ $-$	18.8	W
Operating Junction and Storage Temperature Ra	T _J , T _{stg}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Limit	Unit		
Junction-to-Ambient (PCB Mount) ^c	R _{thJA}	40	°C/W		
Junction-to-Case (Drain)	R _{thJC}	1.2	C/ VV		

Notes:

- a. Duty cycle \leq 1 %.
- b. See SOA curve for voltage derating.
- c. When mounted on 1" square PCB (FR-4 material).

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static		,		<u> </u>			
Drain-Source Breakdown Voltage	V _{DS}	$V_{DS} = 0$, $I_{D} = -250 \mu A$	- 100			V	
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	- 1		- 3	V	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 250	nA	
		V _{DS} = - 100 V, V _{GS} = 0 V			- 1		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 100 V, V _{GS} = 0 V, T _J = 125 °C			- 50		
		V _{DS} = - 100 V, V _{GS} = 0 V, T _J = 150 °C			- 250		
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \le -10 \text{ V}, V_{GS} = -10 \text{ V}$	- 40			Α	
Durin Course On Otata Desistance	B	V _{GS} = - 10 V, I _D = - 14 A		0.035	0.042	1	
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 4.5 V, I _D = - 13 A		0.039	0.047	Ω	
Forward Transconductance ^a	9 _{fs}	V _{DS} = - 20 V, I _D = - 14 A		55		S	
Dynamic ^b	•						
Input Capacitance	C _{iss}			4600		pF	
Output Capacitance	C _{oss}	V _{GS} = 0 V, V _{DS} = - 50 V, f = 1 MHz		230			
Reverse Transfer Capacitance	C_{rss}]		175			
Total Gate Charge ^c	Qg	V _{DS} = - 50 V, V _{GS} = - 10 V, I _D = - 14 A		106	160		
				54	81		
Gate-Source Charge ^c	Q_{gs}	$V_{DS} = -50 \text{ V}, V_{GS} = -4.5 \text{ V}, I_{D} = -14 \text{ A}$		14			
Gate-Drain Charge ^c	Q_{gd}			26			
Gate Resistance	R_g	f = 1 MHz	0.9	4.6	9.2	Ω	
Turn-On Delay Time	t _{d(on)}			15	25		
Rise Time	t _r	$V_{DD} = -50 \text{ V}, R_L = 5 \Omega$		20	30	ns	
Turn-Off Delay Time	t _{d(off)}	$I_D = -10 \text{ A}, V_{GEN} = -10 \text{ V}, R_g = 1 \Omega$		110	165		
Fall Time	t _f			100	150		
Turn-On Delay Time	t _{d(on)}			42	65	- ns	
Rise Time	t _r	V_{DD} = - 50 V, R_L = 10 Ω		160	240		
Turn-Off Delay Time	t _{d(off)}	$I_D = -10 \text{ A}, V_{GEN} = -4.5 \text{ V}, R_g = 1 \Omega$		100	150		
Fall Time	t _f			100	150		
Drain-Source Body Diode Ratings at	nd Characteri	stics T _C = 25 °C ^b					
Continuous Current	I _S				- 36	۸	
Pulsed Current	I _{SM}				- 40	A	
Forward Voltage ^a	V_{SD}	I _F = - 10 A, V _{GS} = 0		- 0.8	- 1.2	V	
Reverse Recovery Time	t _{rr}			60	90	ns	
Peak Reverse Recovery Current	I _{RM(REC)}	I _F = - 10 A, dI/dt = 100 A/μs		2	3	Α	
Reverse Recovery Charge	Q _{rr}	1		150	225	nC	

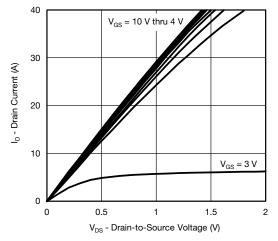
Notes:

- a. Pulse test; pulse width \leq 300 $\mu s,$ duty cycle \leq 2 %.
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

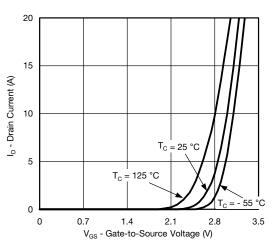
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



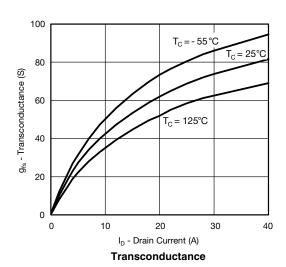
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

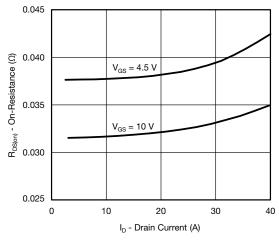


Drain to Source Voltage vs. ID

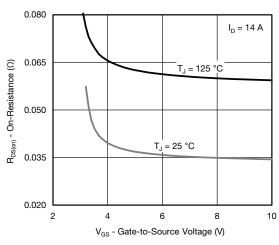


Transfer Characteristics

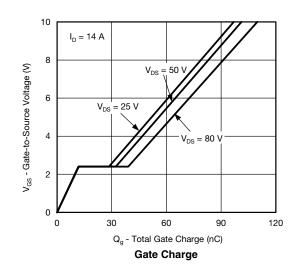




On-Resistance vs. Drain Current

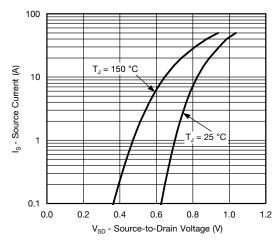


On-Resistance vs. Gate-to-Source Voltage

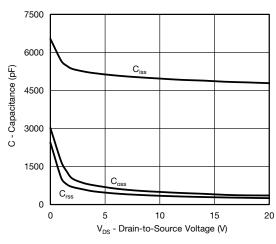


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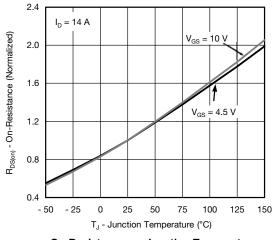
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



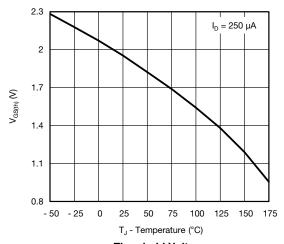
Source-Drain Diode Forward Voltage



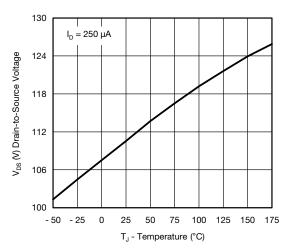
Capacitance



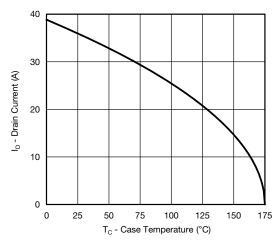
On-Resistance vs. Junction Temperature



Threshold Voltage



Drain Source Breakdown vs. Junction Temperature

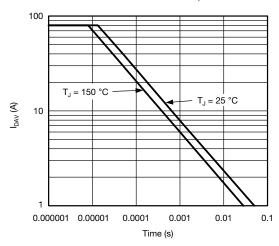


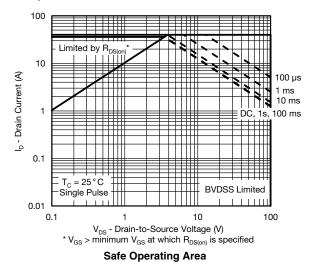
Current Derating



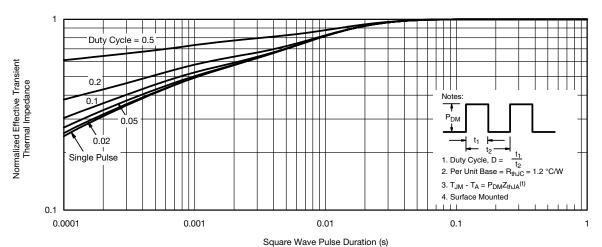


TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)





Single Pulse Avalanche Current Capability vs. Time

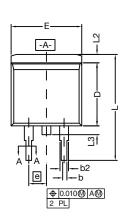


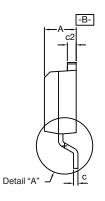
Normalized Thermal Transient Impedance, Junction-to-Case

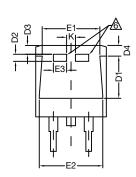
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TO-263 (D²PAK): 3-LEAD

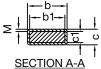








DETAIL A (ROTATED 90°)



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2	T			C	_ (<u>-</u>
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- 1. Plane B includes maximum features of heat sink tab and plastic.
- 2. No more than 25 % of L1 can fall above seating plane by max. 8 mils.
- 3. Pin-to-pin coplanarity max. 4 mils.
- 4. *: Thin lead is for SUB, SYB. Thick lead is for SUM, SYM, SQM.
- 5. Use inches as the primary measurement.

6 This feature is for thick lead.

DIM.		INC	HES	MILLIMETERS		
		MIN.	MAX.	MIN.	MAX.	
Α		0.160	0.190	4.064	4.826	
	b	0.020	0.039	0.508	0.990	
	b1	0.020	0.035	0.508	0.889	
	b2	0.045	0.055	1.143	1.397	
c*	Thin lead	0.013	0.018	0.330	0.457	
	Thick lead	0.023	0.028	0.584	0.711	
c1	Thin lead	0.013	0.017	0.330	0.431	
CI	Thick lead	0.023	0.027	0.584	0.685	
	c2	0.045	0.055	1.143	1.397	
	D	0.340	0.380	8.636	9.652	
	D1	0.220	0.240	5.588	6.096	
	D2	0.038	0.042	0.965	1.067	
	D3	0.045	0.055	1.143	1.397	
	D4	0.044	0.052	1.118	1.321	
	Е	0.380	0.410	9.652	10.414	
	E1	0.245	-	6.223	-	
	E2	0.355	0.375	9.017	9.525	
	E3	0.072	0.078	1.829	1.981	
	е	0.100 BSC		2.54 BSC		
	K	0.045	0.055	1.143	1.397	
	L	0.575	0.625	14.605	15.875	
	L1	0.090	0.110	2.286	2.794	
	L2	0.040	0.055	1.016	1.397	
	L3	0.050	0.070	1.270	1.778	
	L4 0.010 BS		BSC	0.254 BSC		
М		-	0.002	-	0.050	
ECN: T13-0707-Rev. K, 30-Sep-13						

DWG: 5843





RECOMMENDED MINIMUM PADS FOR D²PAK: 3-Lead



Recommended Minimum Pads Dimensions in Inches/(mm)

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Revision: 02-Oct-12 Document Number: 91000