N-Channel 20-V (D-S) MOSFET

Key Features:

- Low r_{DS(on)} trench technology
- · Low thermal impedance
- · Fast switching speed

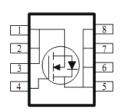
Typical Applications:

- · Load Switches
- DC/DC Conversion
- Motor Drives

PRODUCT SUMMARY				
V _{DS} (V)	$r_{DS(on)}(m\Omega)$	I _D (A)		
20	$5.5 @ V_{GS} = 4.5V$	16		
	$7 @ V_{GS} = 2.5V$	12		







ABSOLUTE MAXIMUM RATINGS ($T_A = 25^{\circ}$ C UNLESS OTHERWISE NOTED)					
Parameter			Limit	Units	
Drain-Source Voltage			20	V	
Gate-Source Voltage	V_{GS}	±8	V		
Continuous Drain Current a	I_D	16	А		
Pulsed Drain Current b	I _{DM}	60			
Continuous Source Current (Diode Conduction) a		I _S	3.6	Α	
Power Dissipation ^a T _A =25°C		P_{D}	2.1	W	
Fower Dissipation	T _A =70°C	' D	1.3	V V	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C	

THERMAL RESISTANCE RATINGS						
Parameter	Symbol	Maximum	Units			
Maximum Junction-to-Ambient ^a	$R_{\theta JA}$	62.5	°C/W			
Maximum Junction-to-Case	$R_{\theta JC}$	110	C/VV			

1

Notes

- a. Surface Mounted on 1" x 1" FR4 Board.
- b. Pulse width limited by maximum junction temperature

Electrical Characteristics

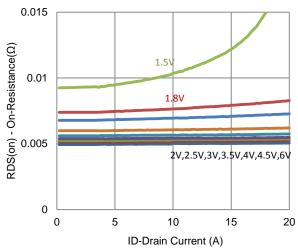
Parameter	Symbol	ool Test Conditions		Тур	Max	Unit	
Static							
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250 \text{ uA}$	0.4			V	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 8 \text{ V}$			±100	nA	
Zoro Coto Voltogo Droin Correct	1	$V_{DS} = 16 \text{ V}, V_{GS} = 0 \text{ V}$			1	uA	
Zero Gate Voltage Drain Current	I _{DSS}	$V_{DS} = 16 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55^{\circ}\text{C}$			10	T UA	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} = 5 \text{ V}, V_{GS} = 4.5 \text{ V}$	24			Α	
Dania Commo On Bonistono a	r	$V_{GS} = 4.5 \text{ V}, I_D = 12 \text{ A}$			5.5	mΩ	
Drain-Source On-Resistance ^a	r _{DS(on)}	$V_{GS} = 2.5 \text{ V}, I_D = 9 \text{ A}$			7	11177	
Forward Transconductance a	g_{fs}	$V_{DS} = 15 \text{ V}, I_{D} = 20 \text{ A}$		16		S	
Diode Forward Voltage ^a	V_{SD}	$I_{S} = 1.8 \text{ A}, V_{GS} = 0 \text{ V}$		0.81		V	
Dynamic ^b							
Total Gate Charge	Q_g	$V_{DS} = 10 \text{ V}, V_{GS} = 4.5 \text{ V},$		43			
Gate-Source Charge	Q_{gs}	$I_{DS} = 10 \text{ V}, V_{GS} = 4.3 \text{ V},$ $I_{D} = 12 \text{ A}$		6.3		nC	
Gate-Drain Charge	Q_gd	1D = 12 A		11			
Turn-On Delay Time	t _{d(on)}	$V_{DS} = 10 \text{ V}, R_1 = 0.5 \Omega,$		13			
Rise Time	t _r	$V_{DS} = 10 \text{ V}, K_L - 0.3 \Omega,$ $I_D = 12 \text{ A},$		29		no	
Turn-Off Delay Time	$t_{d(off)}$	$V_{GEN} = 4.5 \text{ V}, R_{GEN} = 6 \Omega$		131		ns	
Fall Time	t _f	VGEN - 4.5 V, NGEN - 0 12		38			
Input Capacitance	C _{iss}			3535			
Output Capacitance	C _{oss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ Mhz}$		295		pF	
Reverse Transfer Capacitance	C _{rss}			223			

Notes

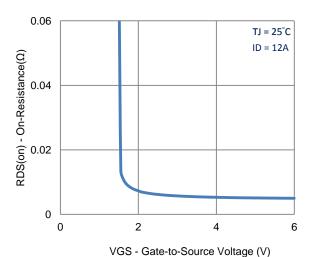
- Pulse test: PW <= 300us duty cycle <= 2%.
- Guaranteed by design, not subject to production testing. b.

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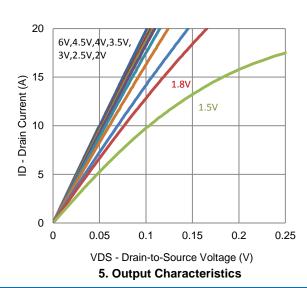
Typical Electrical Characteristics



1. On-Resistance vs. Drain Current



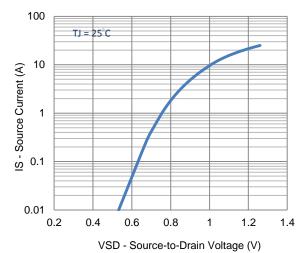
3. On-Resistance vs. Gate-to-Source Voltage



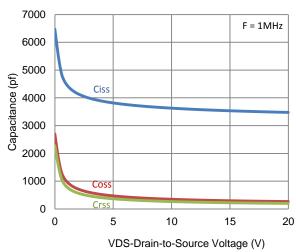
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TJ = 25°C

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2. Transfer Characteristics

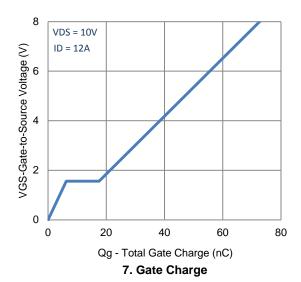


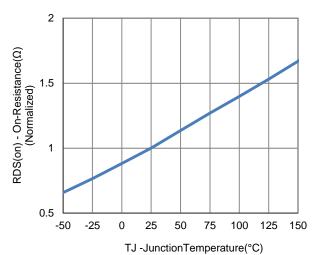
4. Drain-to-Source Forward Voltage



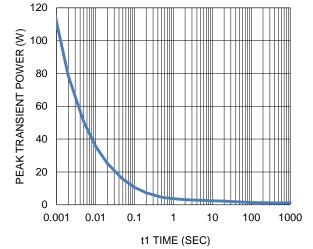
6. Capacitance

Typical Electrical Characteristics





8. Normalized On-Resistance Vs Junction Temperature



VDS Drain to Source Voltage (V)

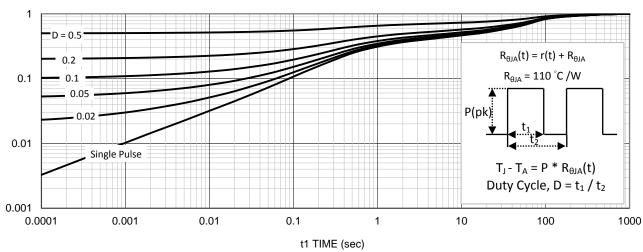
9. Safe Operating Area

10

100

1000

10. Single Pulse Maximum Power Dissipation



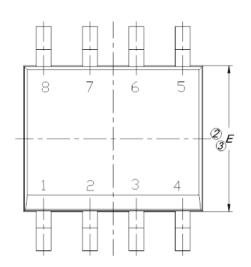
11. Normalized Thermal Transient Junction to Ambient

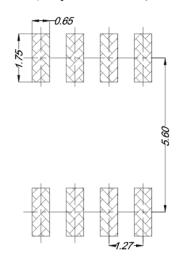
0.01

0.1

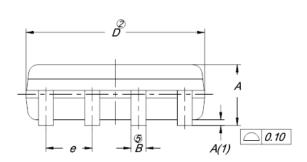
Package Information

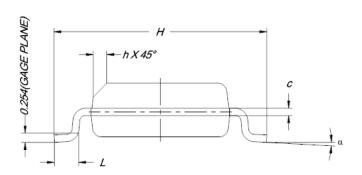
Land Pattern (Only for Reference)





5114	MILLIMETERS			
DIM.	MIN.	NOM.	MAX.	
Α	1.35	1.55	1.75	
A(1)	0.10	0.18	0.25	
В	0.38	0.45	0.51	
С	0.19	0.22	0.25	
D	4.80	4.90	5.00	
E	3.80	3.90	4.00	
е	1.27 BSC			
Н	5.80	6.00	6.20	
L	0.50	0.72	0.93	
α	0°	4°	8°	
h	0.25	0.38	0.50	





Note:

- 1. All Dimension Are In mm.
- 2. Package Body Sizes Exclude Mold Flash, Protrusion Or Gate Burrs. Mold Flash, Protrusion Or Gate Burrs Shall Not Exceed 0.10 mm Per Side.
- 3. Package Body Sizes Determined At The Outermost Extremes Of The Plastic Body Exclusive Of Mold Flash, Tie Bar Burrs, Gate Burrs And Interlead Flash, But Including Any Mismatch Between The Top And Bottom Of The Plastic Body.
- 4. The Package Top May Be Smaller Than The Package Bottom.
- 5. Dimension B" Does Not Include Dambar Protrusion. Allowable Dambar Protrusion Shall Be 0.08 mm Total In Excess Of B" Dimension At Maximum Material Condition. The Dambar Cannot Be Located On The Lower Radius Of The Foot.