40V 2Ω N-Ch Power MOSFET

Features

- Ultra-low $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% R_g Tested
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

Product Summary

Parameter	Value	Unit
V_{DS}	40	V
$V_{GS(th)}$	2.8	V
I_D (@ V_{GS} = 10V) (1)	117	A
$R_{DS(ON)}$ (@ V_{GS} = 10V)	2.7	mΩ

Applications

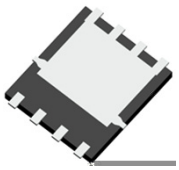
- Power Management in Computing, CE, IE 4.0, Communications
- Current Switching in DC/DC & AC/DC (SR) Sub-systems
- Load Switching, Quick/Wireless Charging, Motor Driving

PDFN5x6-8L

Top View



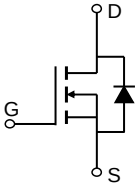
Bottom View



Pin Configuration

Top View





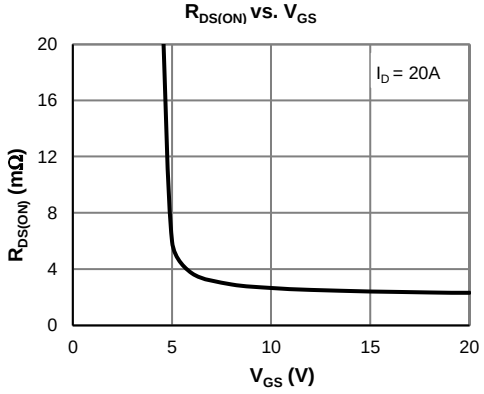
Ordering Information

Device	Package	# of Pins	Marking	MSL	T_J (°C)	Media	Quantity (pcs)
JMSH0403AG-13	PDFN5x6-8L	8	SH0403A	1	-55 to 150	13-inch Reel	5000

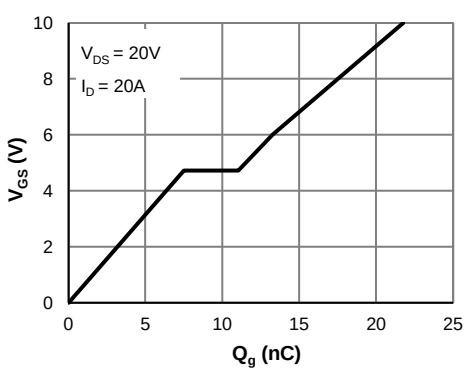
Absolute Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
	V_{DS}		V
	V_{GS}		V
	I_{DM}		A
	E_{AS}		mJ
	T_J I P u l s e d J M S H 0 4 0 3 A G		

$R_{DS(ON)}$ vs. V_{GS}



Gate Charge



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Electrical Characteristics (@ T_J = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 250μA, V_{GS} = 0V	40			V
		V_{DS} = 32V, V_{GS} = 0V			1.0	
		T_J = 55°C			5.0	
	I_{GSS}				±100	nA
Gate Threshold Voltage	$V_{GS(th)}$		2.2	2.8	3.4	V
	$R_{DS(ON)}$			2.7	3.4	mΩ
Forward Transconductance	g_{FS}	V_{DS} = 5V, I_D = 20A		94		S
Diode Forward Voltage	V_{SD}	I		0.70	1.0	V
	I_S	T_C = 25°C			78	A
DYNAMIC PARAMETERS [5]						
Input Capacitance	C_{iss}			1542		pF
Output Capacitance	C_{oss}	V_{GS} = 0V, V_{DS} = 20V, f = 1MHz		1020		pF
Reverse Transfer Capacitance	C_{rss}			43		pF
Gate Resistance	R_g	V_{GS} = 0V, V_{DS}= 0V, f = 1MHz		3.8		Ω
SWITCHING PARAMETERS [5]						
Total Gate Charge (@ V_{GS} = 10V)	Q_g			22		nC
Total Gate Charge (@ V_{GS} = 6.0V)	Q_g	V_{GS} = 0 to 10V		13.3		nC
Gate Source Charge	Q_{gs}	V_{DS} = 20V, I_D = 20A		7.5		nC
Gate Drain Charge	Q_{gd}			3.5		nC
Turn-On DelayTime	$t_{D(on)}$			9.0		ns
Turn-On Rise Time	t_r	V_{GS} = 10V, V_{DS} = 20V		13.5		ns
Turn-Off DelayTime	$t_{D(off)}$	R_L = 1.0Ω, R_{GEN} = 3Ω		21		ns
Turn-Off Fall Time	t_f			4.7		ns
	t_{rr}			37		ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F = 20A, dI_F/dt = 100A/μs		23		nC

Thermal Performance

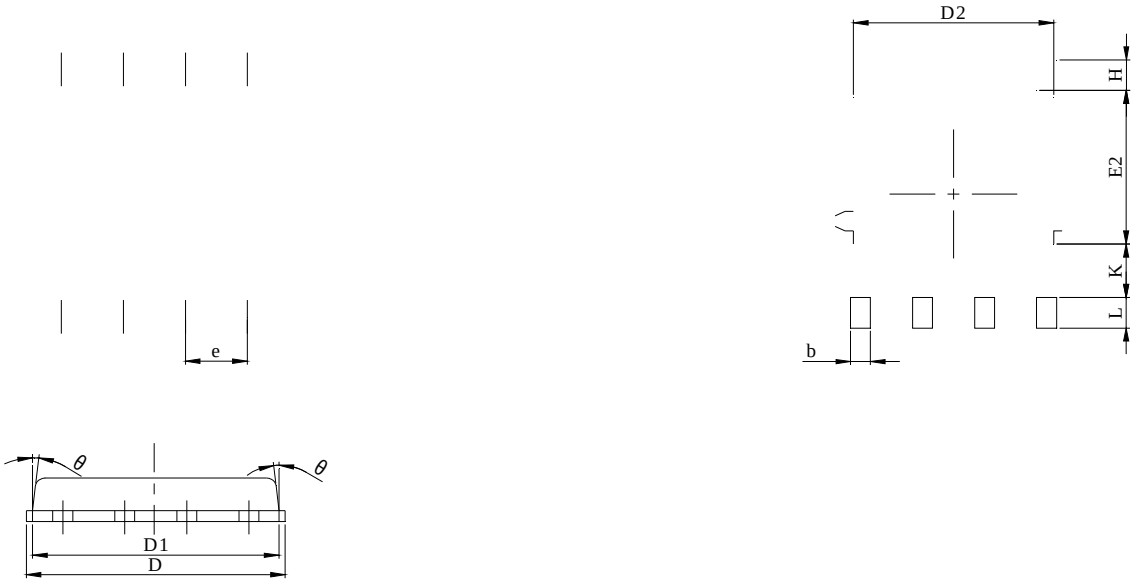
Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	52	60	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.6	2.0	°C/W

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T_{J_Max} = 150°C.
3. E_{AS} of 216 mJ is based on starting T_J = 25°C,L = 3.0mH, I_{AS} = 12A, V_{GS} = 10V, V_{DD} = 20V; 100% test at L = 0.3mH, I_{AS} = 23A.
4. The power dissipation P_D is based on T_{J_Max} = 150°C.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

PDFN5x6-8L Package Information



10° > >

θ - - 10°