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Approved by:
Checked by:
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# SPECIFICATION

.....PRODUCT: P-Channel High Density Trench

.....MODEL: MAR 6 4 0 1 SOT23 .....

**HOPE MICROELECTRONIC CO.,LIMITED**

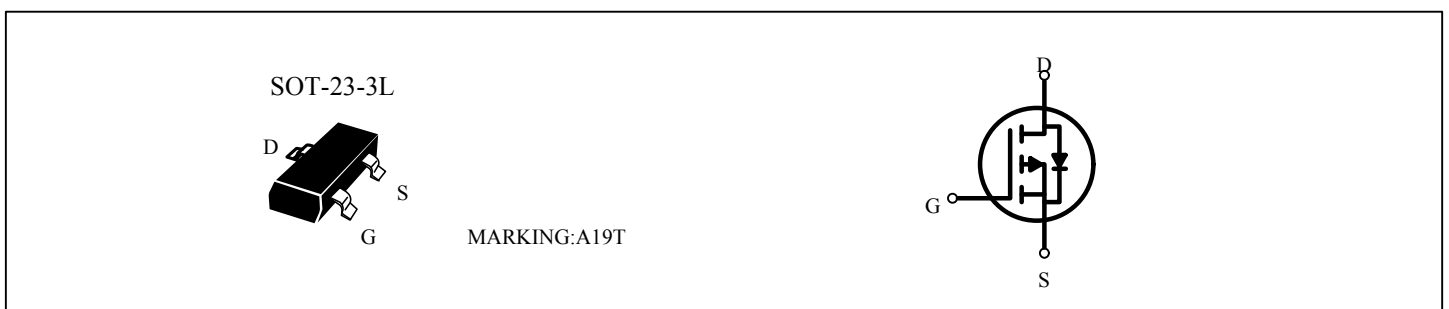
# P-Channel High Density Trench MOSFET

# MAR6401

PRODUCT SUMMARY		
V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(on)</sub> (m-ohm) Max
-30V	-4.2A	64 @ V <sub>GS</sub> = -10V
		75 @ V <sub>GS</sub> = -4.5V
		120 @ V <sub>GS</sub> = -2.5V

## FEATURES

- Super high dense cell trench design for low R<sub>DS(on)</sub>.
- Rugged and reliable.
- SOT-23-3L package.



## ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	-30	V
Gate-Source Voltage	V <sub>GS</sub>	± 12	V
Drain Current-Continuous <sup>a</sup> @ T <sub>A</sub> = 25 °C -Pulse <sup>b</sup>	I <sub>D</sub>	-4.2	A
	I <sub>DM</sub>	-16	A
Drain-Source Diode Forward Current <sup>a</sup>	I <sub>S</sub>	-2.2	A
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	1.25	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	- 55 to 150	°C

## THERMAL CHARACTERISTICS

Parameter	Symbol	Typ <sup>c</sup>	Max	Unit
Thermal Resistance, Junction-to-Ambient <sup>a</sup>	R <sub>thJA</sub>	75	100	°C/W

Note :

a. Surface Mounted on FR4 Board , t ≤ 5sec .

b. Pulse Test : Pulse width ≤ 300us , Duty Cycle ≤ 2% .

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ <sup>c</sup>	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V , I <sub>D</sub> = -250uA	- 30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -24V , V <sub>GS</sub> = 0V			-1	uA
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>GS</sub> = -12V , V <sub>DS</sub> = 0V			-100	nA
<b>ON CHARACTERISTICS<sup>b</sup></b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250uA	-0.5		-1.3	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V , I <sub>D</sub> = -4.2A			64	m-ohm
		V <sub>GS</sub> = -4.5V , I <sub>D</sub> = -3.0A			75	m-ohm
		V <sub>GS</sub> = -2.5V , I <sub>D</sub> = -1.2A			120	m-ohm
<b>DRAIN-SOURCE DIODE CHARACTERISTICS<sup>b</sup></b>						
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0V , I <sub>S</sub> = -1.0A			-1.2	V
<b>DYNAMIC CHARACTERISTICS<sup>c</sup></b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> = 15V , V <sub>GS</sub> = 0V f = 1.0MHz		1325		pF
Output Capacitance	C <sub>OSS</sub>			172		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			140		pF
<b>SWITCHING CHARACTERISTICS<sup>c</sup></b>						
Turn-On Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> = -15V , I <sub>D</sub> = -1A V <sub>GEN</sub> = -4.5V R <sub>L</sub> = 15 ohm R <sub>GEN</sub> = 10 ohm		5		ns
Rise Time	t <sub>r</sub>			3		ns
Turn-Off Delay Time	t <sub>D(OFF)</sub>			30		ns
Fall Time	t <sub>f</sub>			10		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -15V I <sub>D</sub> = -1A V <sub>GS</sub> = -10V		27.8		nC
Gate-Source Charge	Q <sub>gs</sub>			3.2		nC
Gate-Drain Charge	Q <sub>gd</sub>			2.72		nC

Note :

b. Pulse Test : Pulse width ≤ 300us , Duty Cycle ≤ 2% .

c. Guaranteed by design , not subject to production testing .