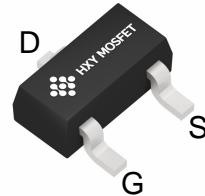




Description

The HXY7N04MI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



SOT-23-3L

General Features

$V_{DS} = 40V$ $I_D = 7A$

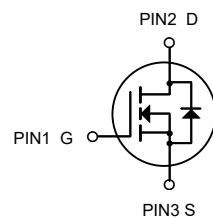
$R_{DS(ON)} < 24m\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HXY7N04MI	SOT23-3L	40N05	3000

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-source voltage	30	V
V_{GS}	Gate-source voltage	± 12	V
I_D	Drain current-continuous ^a @ $T_j=125^\circ C$ -pulse d^b	7.0	A
		32.8	A
I_S	Drain-source Diode forward current	7	A
P_D	Maximum power dissipation	2.0	W
T_j	Operating junction Temperature range	-55—150	$^\circ C$
$R_{th JA}$	Thermal Resistance junction-to ambient	100	$^\circ C/W$



N-Channel Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristics						
$V_{(\text{BR})\text{DSS}}$	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40\text{V}$, $V_{GS}=0\text{V}$	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0\text{V}$, $V_{GS}=\pm 20\text{V}$	-	-	± 100	nA
On Characteristics						
$V_{GS(\text{th})}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.0	1.5	2.5	V
$R_{DS(\text{on})}$ note3	Static Drain-Source on-Resistance	$V_{GS}=10\text{V}$, $I_D=8\text{A}$	-	19	24	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}$, $I_D=5\text{A}$	-	25	35	$\text{m}\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=20\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$	-	633	-	pF
C_{oss}	Output Capacitance		-	67	-	pF
C_{rss}	Reverse Transfer Capacitance		-	58	-	pF
Q_g	Total Gate Charge	$V_{DS}=20\text{V}$, $I_D=8\text{A}$, $V_{GS}=10\text{V}$	-	12	-	nC
Q_{gs}	Gate-Source Charge		-	3.2	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	3.1	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}= 20\text{V}$, $R_L = 2.5\Omega$ $V_{GS}=10\text{V}$, $R_{REN} = 3\Omega$	-	4	-	ns
t_r	Turn-on Rise Time		-	3	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	15	-	ns
t_f	Turn-off Fall Time		-	2	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_s	Maximum Continuous Drain to Source Diode Forward Current		-	-	7	A
I_{sM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	32	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0\text{V}$, $I_s = 8\text{A}$	-	-	1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition : $T_J=25^\circ\text{C}$, $V_{DD}=20\text{V}$, $V_G=10\text{V}$, $L=0.5\text{mH}$, $R_g=25\Omega$, $I_{AS}=7.2\text{A}$

$T_J=25^\circ\text{C}$, $V_{DD}=-20\text{V}$, $V_G= -10\text{V}$, $L=0.5\text{mH}$, $R_g=25\Omega$, $I_{AS}=-8.4\text{A}$

3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$



Typical Performance Characteristics-N

Figure1: Output Characteristics

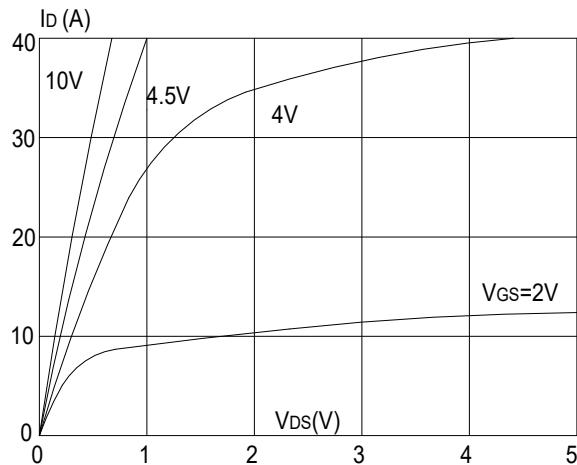


Figure 2: Typical Transfer Characteristics

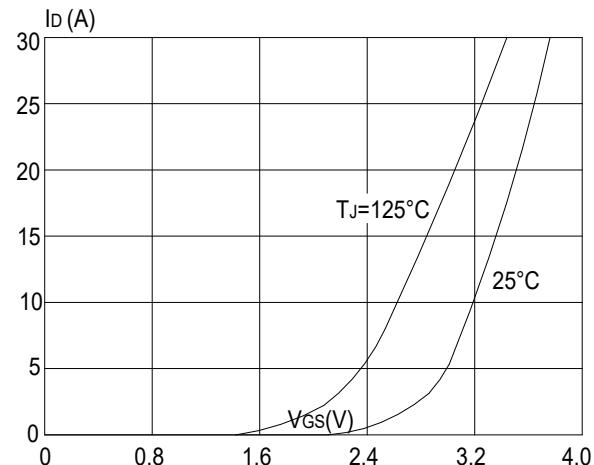


Figure 3: On-resistance vs. Drain Current

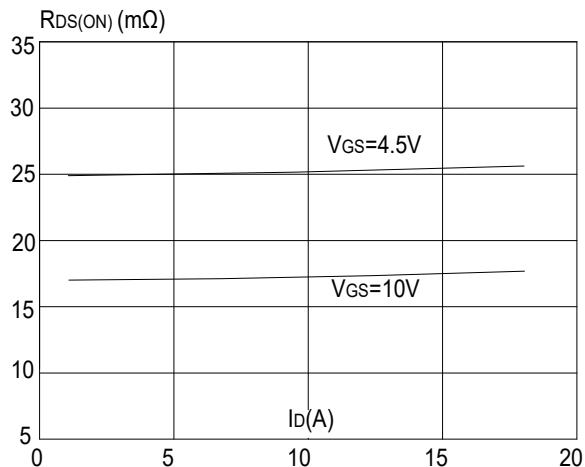


Figure 4: Body Diode Characteristics

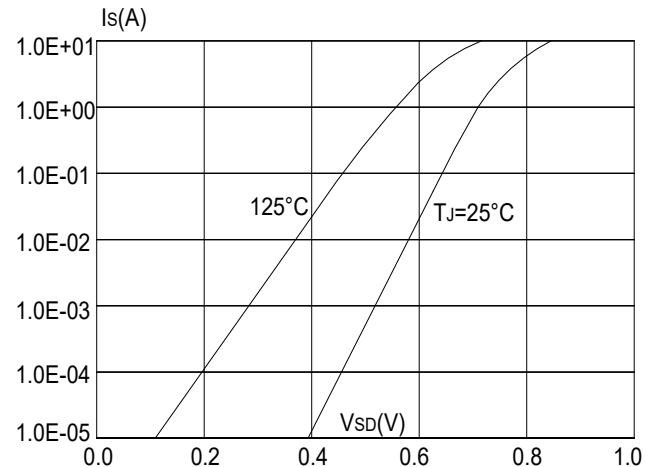


Figure 5: Gate Charge Characteristics

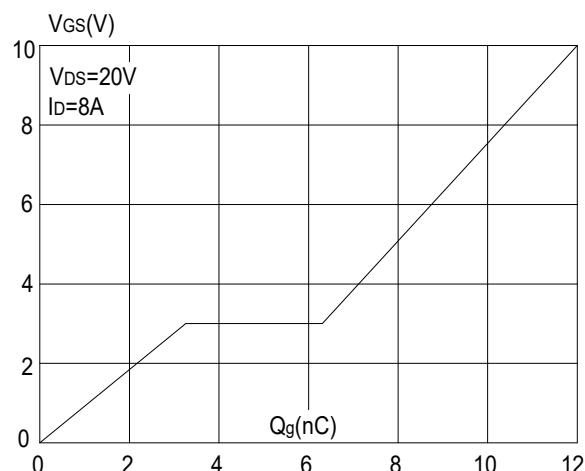


Figure 6: Capacitance Characteristics

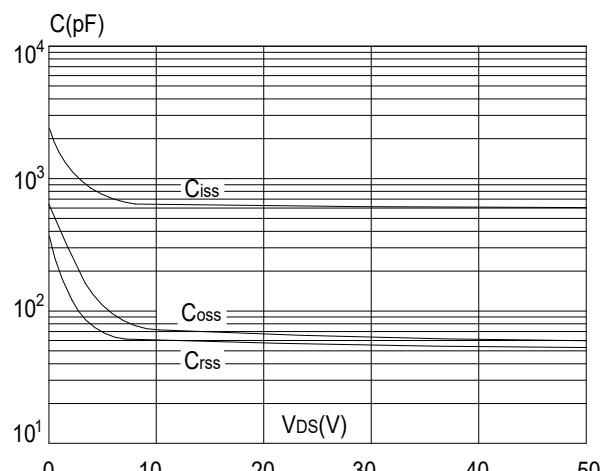




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

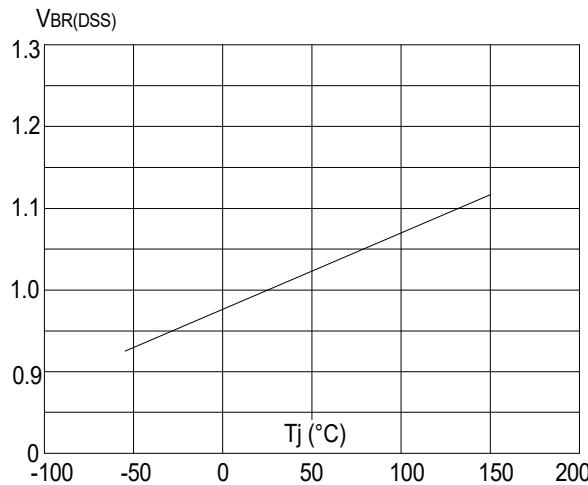


Figure 9: Maximum Safe Operating Area

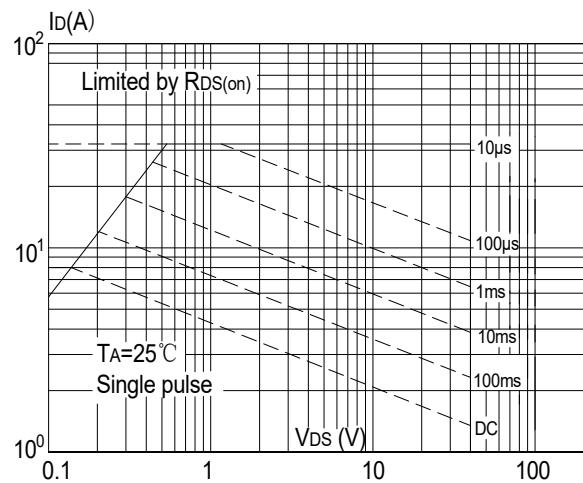


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

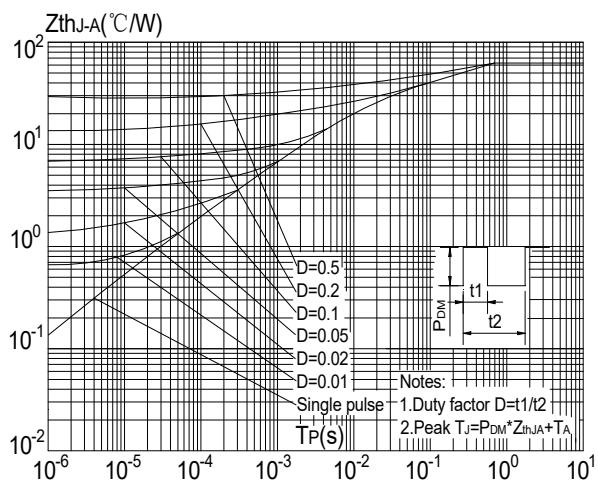


Figure 8: Normalized on Resistance vs. Junction Temperature

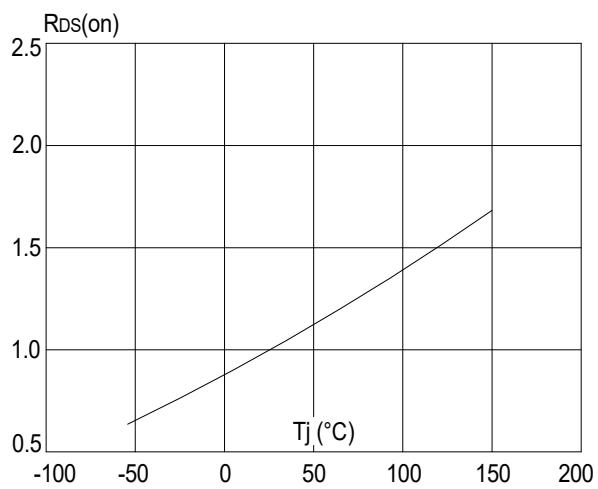
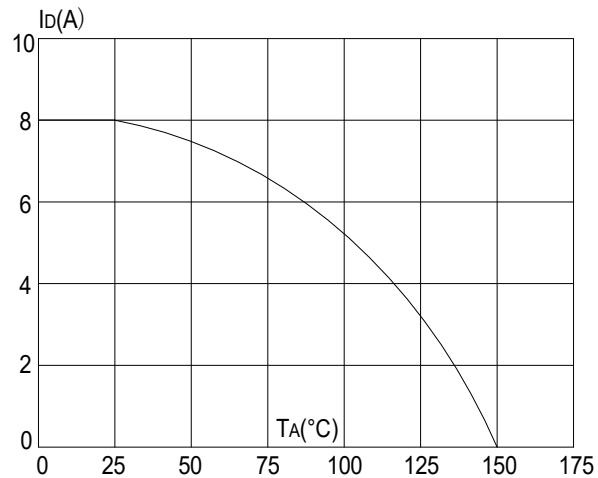
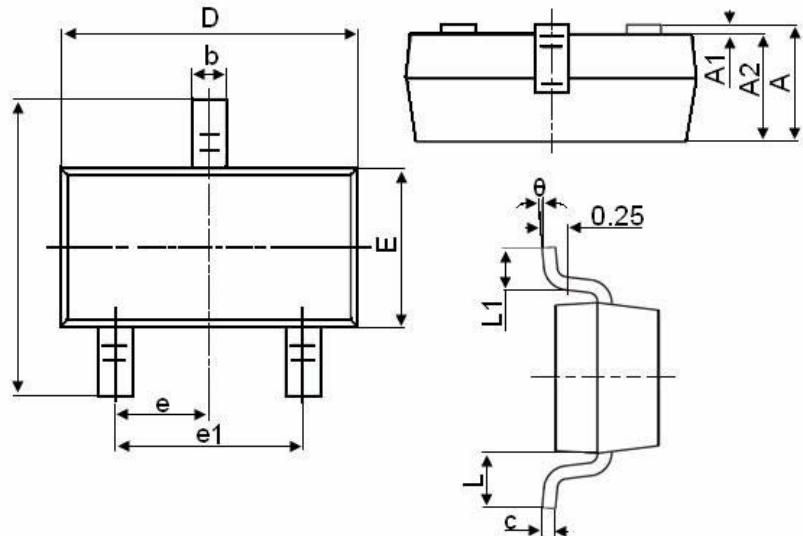


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature





SOT-23-3L Package Information



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°



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