



800 V N-Channel SIC MOSFET

Features

- ◆ Effectively lower down T_j and R_{th} , High anti-EMI ability
- ◆ High Speed Switching with Low Capacitances
- ◆ High Blocking Voltage with Low $R_{DS(on)}$
- ◆ Easy to drive and parallel
- ◆ RoHS Compliant

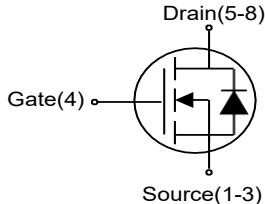
Benefits

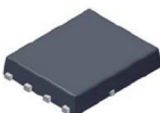
- ◆ Increased Power Density
- ◆ Higher Operating Frequency
- ◆ Reduc Heat Sink Requirements
- ◆ Higher Efficiency
- ◆ EMI Reduction

Applications

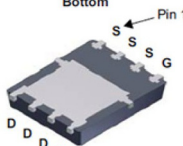
- ◆ Power Factor Correction Modules
- ◆ Switch Mode Power Supplies
- ◆ Power Inverters
- ◆ High Voltage Converters

ORDERING INFORMATION





Top



Bottom

Power 56

DFN-8(5x6) RD
SUFFIX
HT80N10ARDZ

&HT80N10 = Specific Device Code
 &A = Version
 &RD = Packaging
 &Z = Pb-Free Package
 &# = Date Code

$T_A = -55^\circ$ to 175° C for all packages

Maximum ratings ($T_j=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Value	Unit
VDS	Drain-Source Voltage		650	V
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$ $T_c=100^\circ\text{C}$	12 9	A
I_{DM}	Peak Drain Current	Pulse width t_p limited by T_{jmax}	30	A
VGSmax	Gate-Source Voltage		-5/ 26	V
VGSop	Recommend Gate-Source Voltage		0/ 18	V
P_{tot}	Power Dissipation	$T_c=25^\circ\text{C}$ $T_c=100^\circ\text{C}$	52 25	W
T_j	Operating Junction Temperature		-55~175	$^\circ\text{C}$
T_{stg}	Storage Temperature		-55~175	$^\circ\text{C}$

Electrical Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	650		850	V	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}$	
I_{DSS}	Zero Gate Voltage Drain Current		2	100	μA	$V_{GS} = 0\text{ V}, V_{DS} = 750\text{ V}$	
I_{GSS+}	Gate-Source Leakage Current			200	nA	$V_{DS} = 0\text{ V}, V_{GS} = +22\text{ V}$	
I_{GSS-}	Gate-Source Leakage Current			200	nA	$V_{DS} = 0\text{ V}, V_{GS} = -10\text{ V}$	
$V_{GS(th)}$	Gate Threshold Voltage		3.5	4.2	V	$V_{GS} = V_{DS}, I_{DS} = 1\text{ mA}, T_J = 25^\circ\text{C}$	Fig. 14
			2.8			$V_{GS} = V_{DS}, I_{DS} = 1\text{ mA}, T_J = 175^\circ\text{C}$	
$R_{DS(on)}$	Static Drain-Source On-Resistance		360	400	m Ω	$V_{GS} = 15\text{ V}, I_D = 6\text{ A}, T_J = 25^\circ\text{C}$	Fig. 15
			240	260		$V_{GS} = 18\text{ V}$	
			395			$V_{GS} = 15\text{ V}, I_D = 6\text{ A}, T_J = 175^\circ\text{C}$	
C_{iss}	Input Capacitance		208		pF	$V_{DS} = 400\text{ V}, f = 1\text{ MHz}, V_{GS} = 0\text{ V}$	Fig. 8
C_{oss}	Output Capacitance		18				
C_{rss}	Reverse Transfer Capacitance		1.8				
Q_g	Total Gate Charge		10.6		nC	$V_{DD} = 400\text{ V}, V_{GS} = -5/18\text{ V}, I_D = 5\text{ A}$	Fig. 7
Q_{gs}	Gate-Source Charge		5.1				
Q_{gd}	Gate-Drain Charge		2.2				
$R_{G(int)}$	Gate Input Resistance		1.2		Ω	$f = 1\text{ MHz}, I_D = 0\text{ A}$	
E_{on}	Turn-On Switching Energy		25		μJ	$V_{DD} = 400\text{ V}, I_D = 5\text{ A}, R_G = 10\ \Omega,$ $V_{GS} = -5/18\text{ V}$	Fig. 12
E_{off}	Turn-Off Switching Energy		10				
$t_{d(on)}$	Turn-On Delay Time		5		ns	$V_{DD} = 400\text{ V}, I_D = 5\text{ A}, R_G = 10\ \Omega,$ $V_{GS} = -5/18\text{ V}$	
t_r	Rise Time		17				
$t_{d(off)}$	Turn-Off Delay Time		8				
t_f	Fall Time		10				

Reverse SiC Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	4.0		V	$V_{GS} = -4\text{ V}, I_{SD} = 5\text{ A}, T_J = 25^\circ\text{C}$	Fig. 16
		3.6			$V_{GS} = -4\text{ V}, I_{SD} = 5\text{ A}, T_J = 175^\circ\text{C}$	Fig. 17
$*I_{SD}$	Continuous Diode Forward Current		12	A	$T_C = 25^\circ\text{C}$	
			8		$T_C = 175^\circ\text{C}$	
t_{rr}	Reverse Recovery Time	50		ns	$I_{SD} = 5\text{ A}, di/dt = 1000\text{ A}/\mu\text{s},$ $V_{DD} = 400\text{ V}, V_{GS} = -5\text{ V}$	
Q_{rr}	Reverse Recovery Charge	38		nC		
I_{RRM}	Peak Reverse Recovery Current	2.4		A		

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Test Conditions	Note
R_{thJC}	Thermal Resistance from Junction to Case	2.88	°C/W		Fig. 2
R_{thJA}	Thermal Resistance From Junction to Ambient	40			

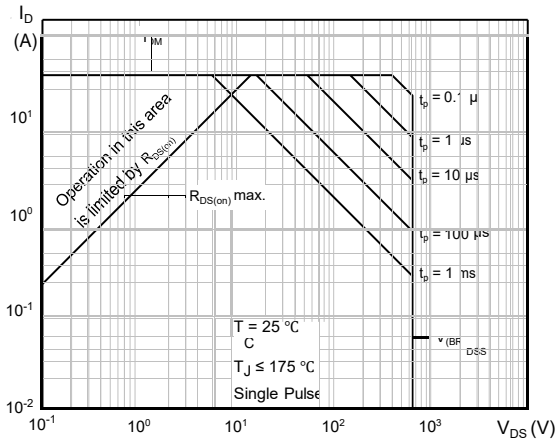
Electrical Characteristics


Figure 1. Safe Operating Area

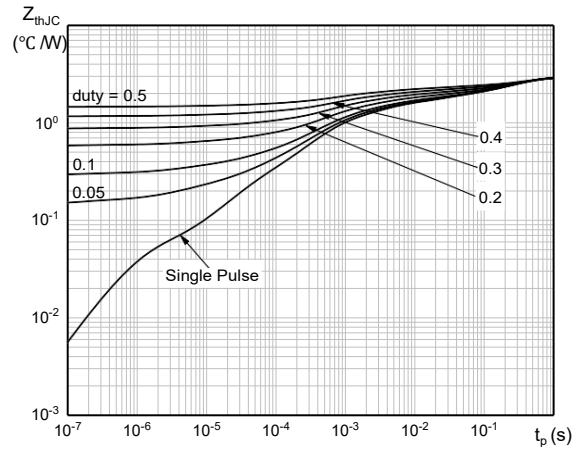


Figure 2. Maximum Transient Thermal Impedance

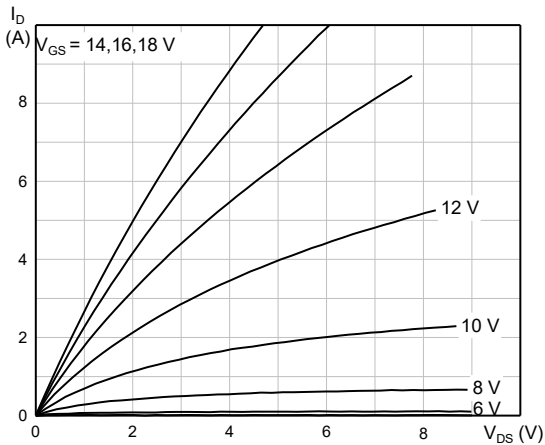
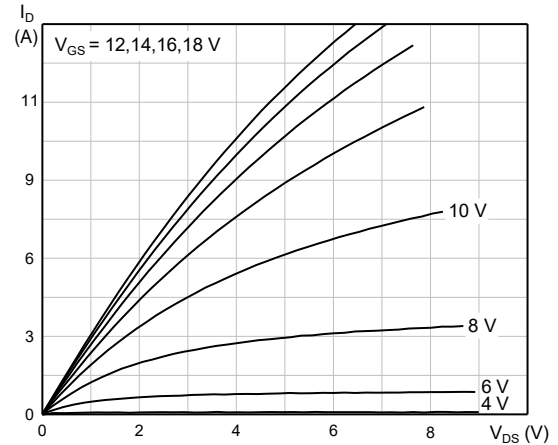
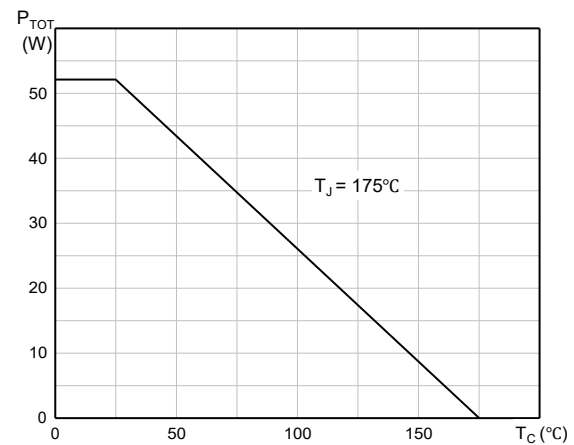
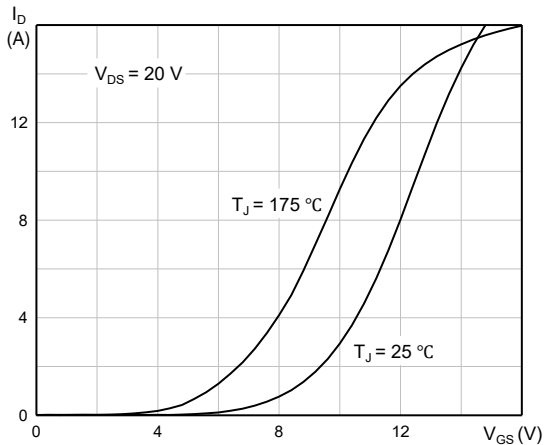

 Figure 3. Typical Output Characteristics, $T_J = 25^\circ\text{C}$

 Figure 4. Typical Output Characteristics, $T_J = 175^\circ\text{C}$


Figure 5. Typical Transfer Characteristics

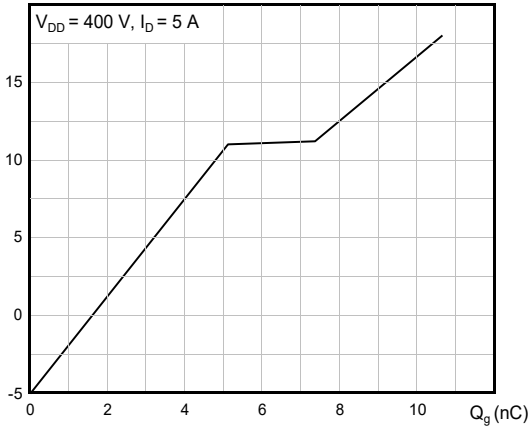


Figure 7. Typical Gate Charge Characteristics

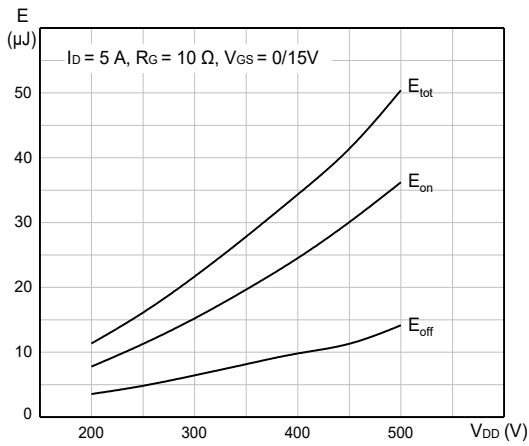


Figure 9. Typical Switching Energy vs. Supply Voltage

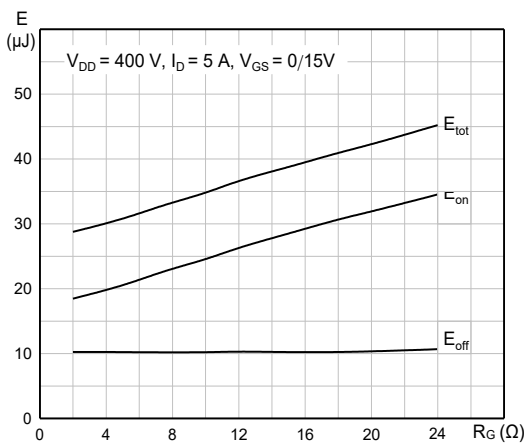


Figure 11. Switching Energy vs. Gate Resistance

Figure 6. Total Power Dissipation

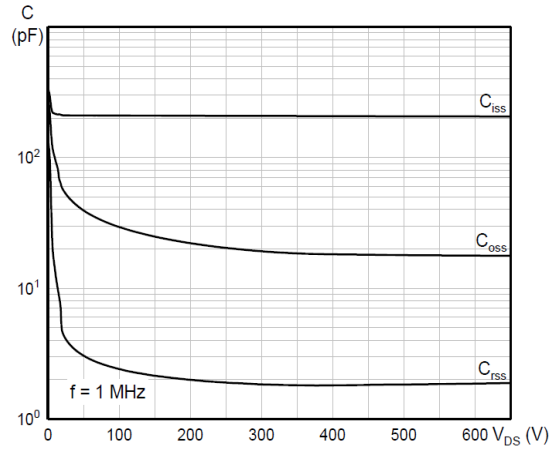


Figure 8. Typical Capacitance Characteristics

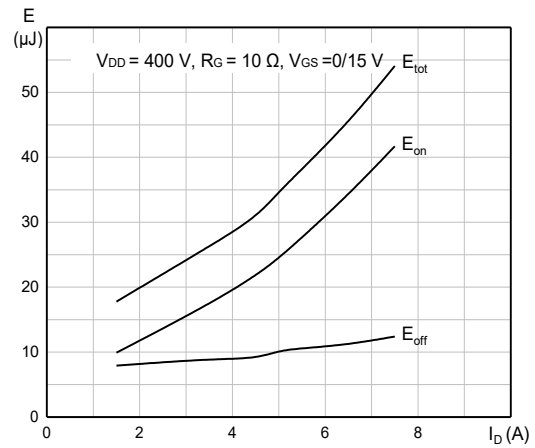


Figure 10. Typical Switching Energy vs. Drain Current

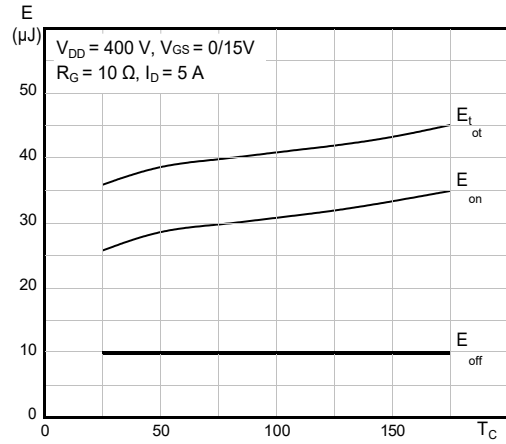


Figure 12. Typical Switching Energy vs. Temperature

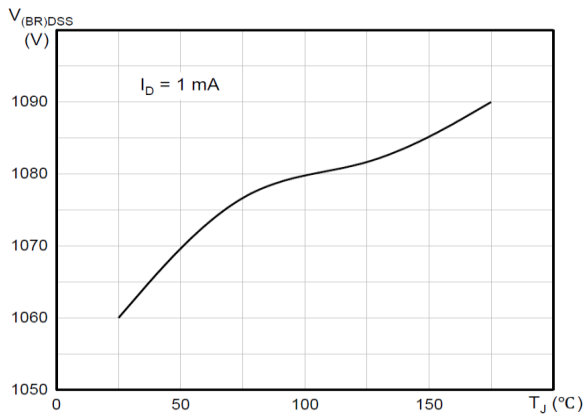


Figure 13. Breakdown Voltage vs. Temperature

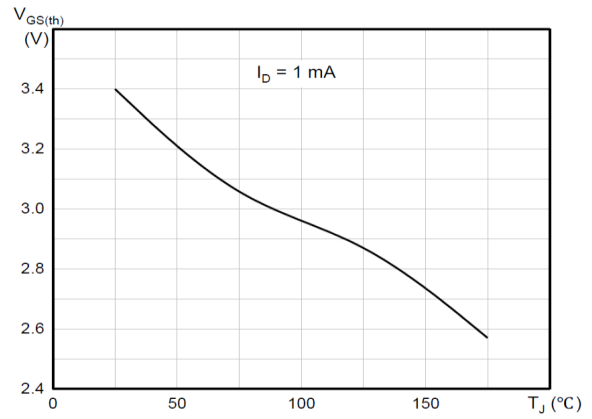


Figure 14. Gate Threshold vs. Temperature

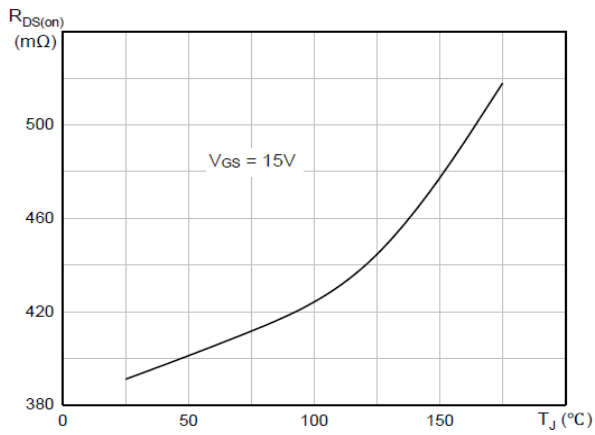


Figure 15. On-Resistance vs. Temperature

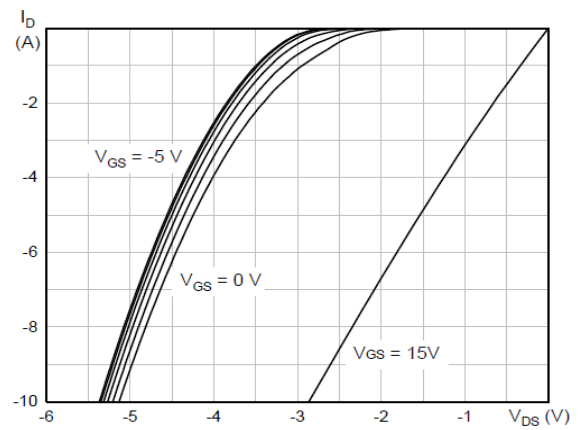


Figure 16. Body Diode Characteristics, $T_J = 25^\circ\text{C}$

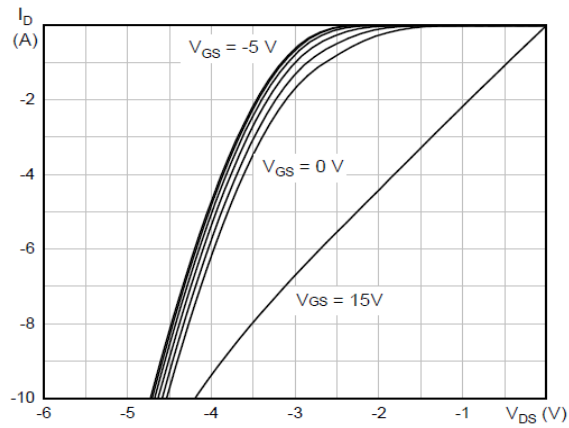
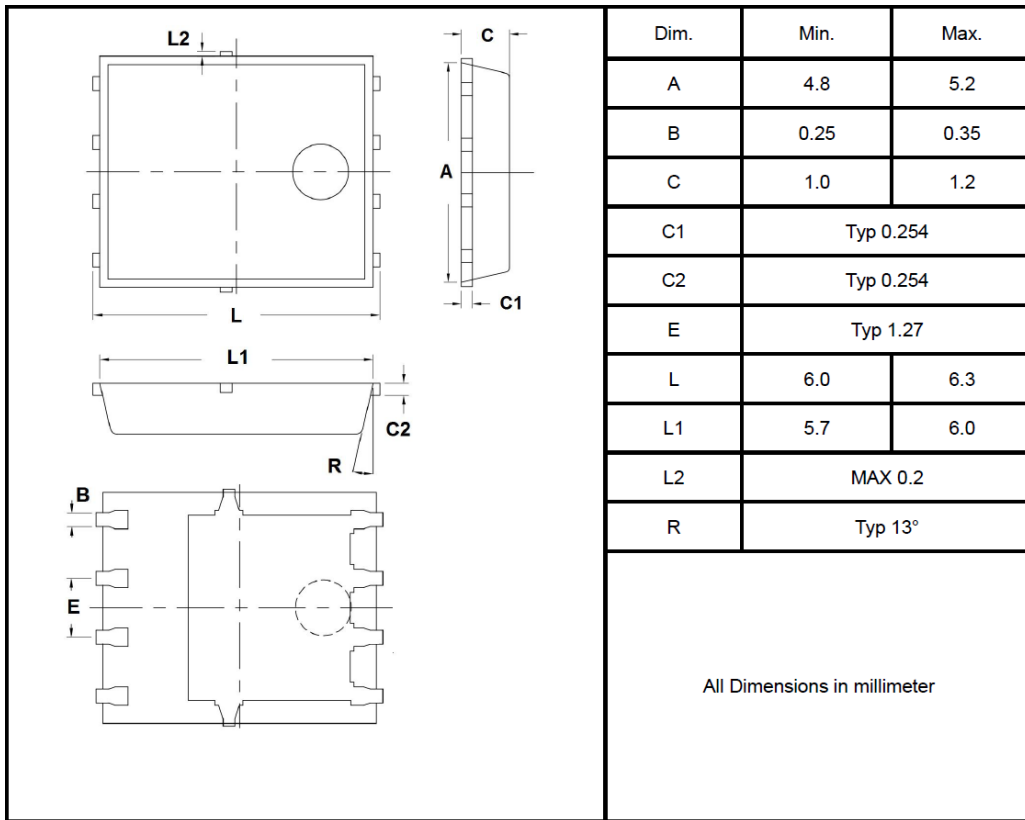


Figure 17. Body Diode Characteristics, $T_J = 175^\circ\text{C}$

Package Outline Dimension: PDFN 5*6



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