



### General Description

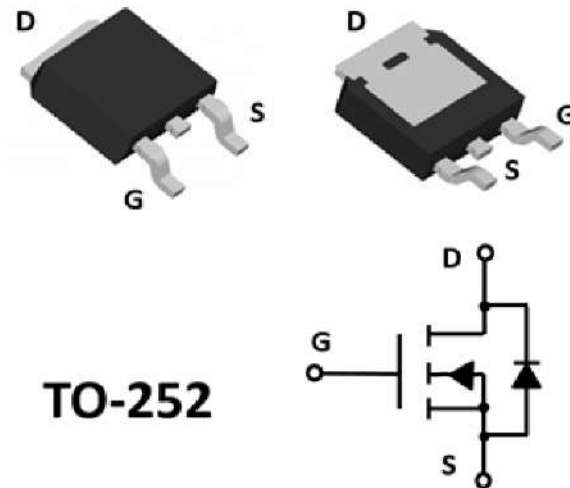
- Low  $R_{DS(on)}$  & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

### Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

### Product Summary

$V_{DS}$	100	V
$R_{DS(on), Typ @ V_{GS}=10V}$	14	m $\Omega$
$I_D$	45	A



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

Parameter	Symbol	Limit	Unit
Drain-source Voltage	$V_{DS}$	100	V
Gate-source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	$T_C=25^\circ\text{C}$	45
		$T_C=100^\circ\text{C}$	28.5
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	180	A
Avalanche energy <sup>B</sup>	$E_{AS}$	81	mJ
Total Power Dissipation <sup>C</sup>	$P_D$	$T_C=25^\circ\text{C}$	72
		$T_C=100^\circ\text{C}$	28.8
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

### Thermal resistance

Parameter	Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient <sup>D</sup>	$R_{\theta JA}$	$t \leq 10S$	15	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Ambient <sup>D</sup>		Steady-State	40	
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	Steady-State	1.35	



ASCENDSEMI

ASDM100R160NKQ

100V N-Channel Power MOSFET

**Electrical Characteristics** ( $T_j=25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.8	3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		14	17	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$		17	21.5	m $\Omega$
Diode Forward Voltage	$V_{SD}$	$I_S=20A, V_{GS}=0V$			1.3	V
Maximum Body-Diode Continuous Current	$I_S$				45	A
Gate resistance	$R_G$	f= 1 MHz, Open drain		1		$\Omega$
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V, f=1MHz$		1135		pF
Output Capacitance	$C_{oss}$			399		
Reverse Transfer Capacitance	$C_{rss}$			18		
<b>Switching Parameters</b>						
Total Gate Charge	$Q_g$	$V_{GS}=10V, V_{DS}=50V, I_D=25A$		16		nC
Gate-Source Charge	$Q_{gs}$			5.6		
Gate-Drain Charge	$Q_{gd}$			2.4		
Reverse Recovery Charge	$Q_{rr}$	$I_F=20A, di/dt=100A/\mu s$		42		ns
Reverse Recovery Time	$t_{rr}$			39.8		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=50V, I_D=25A$ $R_{GEN}=2.2\Omega$		39.2		ns
Turn-on Rise Time	$t_r$			11		
Turn-off Delay Time	$t_{D(off)}$			53.2		
Turn-off fall Time	$t_f$			15.8		

A. Repetitive rating; pulse width limited by max. junction temperature.

B.  $V_{DD}=50V, R_G=25\Omega, L=0.5mH, I_{AS}=25A,$ .

C. Pd is based on max. junction temperature, using junction-case thermal resistance.

D. The value of RqJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The Power dissipation PDSM is based on R qJA  $\leq 10s$  and the maximum allowed junction temperature of  $150^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

## Typical Performance Characteristics

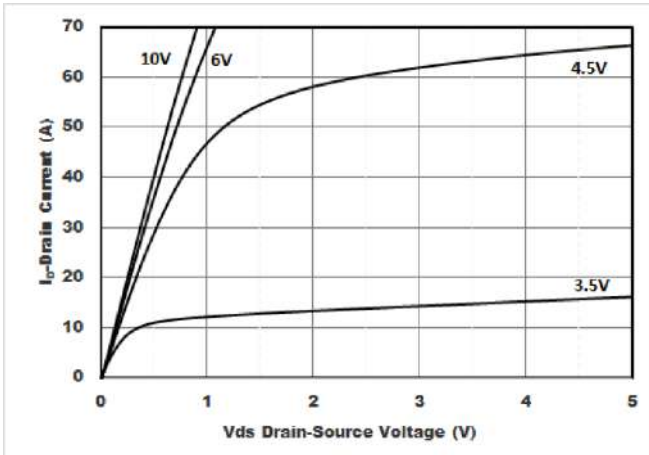


Figure1. Output Characteristics

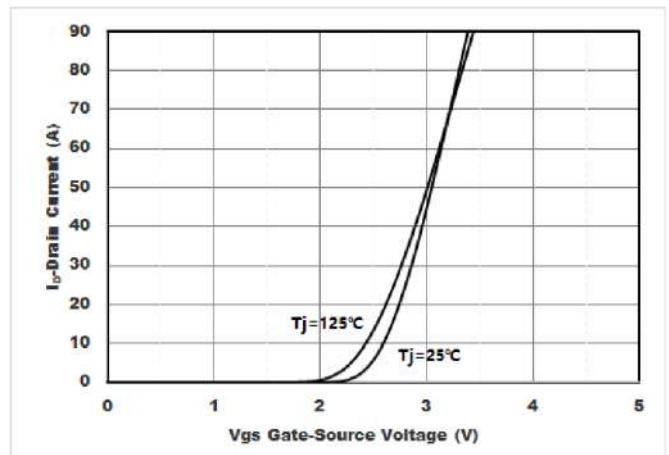


Figure2. Transfer Characteristics

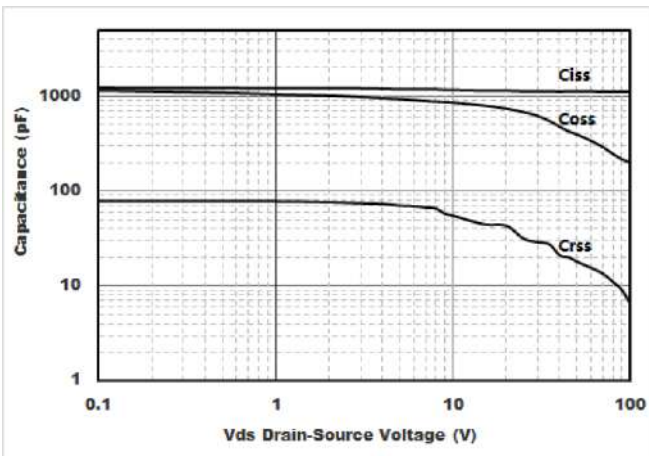


Figure3. Capacitance Characteristics

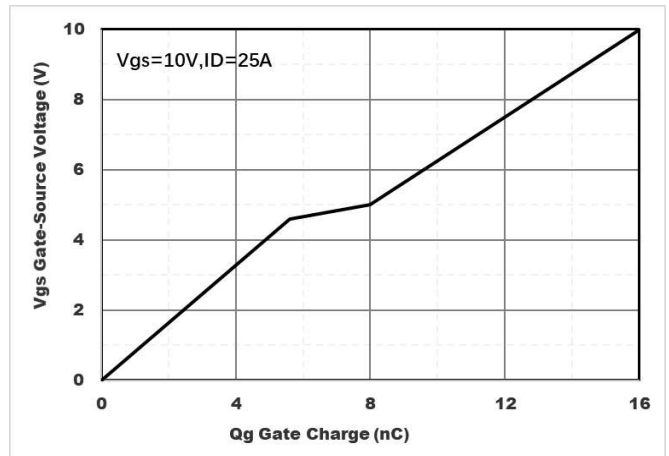


Figure4. Gate Charge

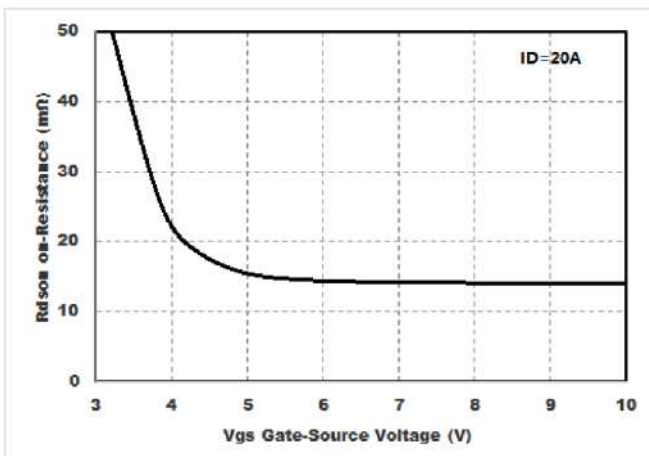


Figure5. : On-Resistance vs. Drain Current and Gate Voltage

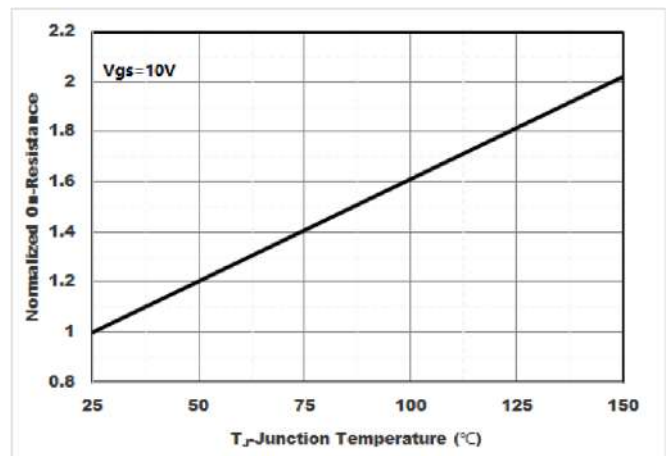


Figure6. Normalized On-Resistance

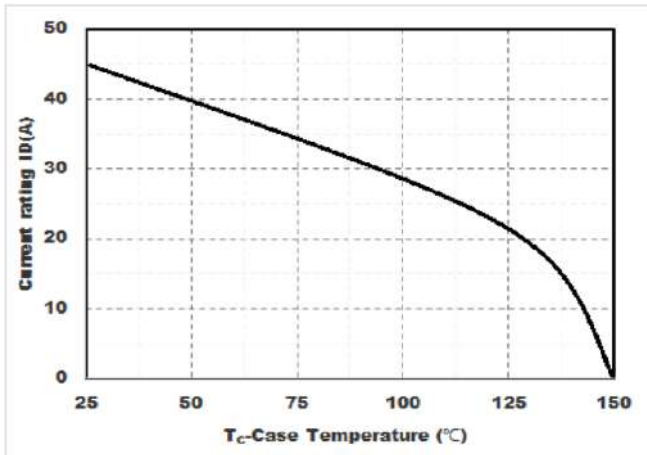


Figure7. Drain current

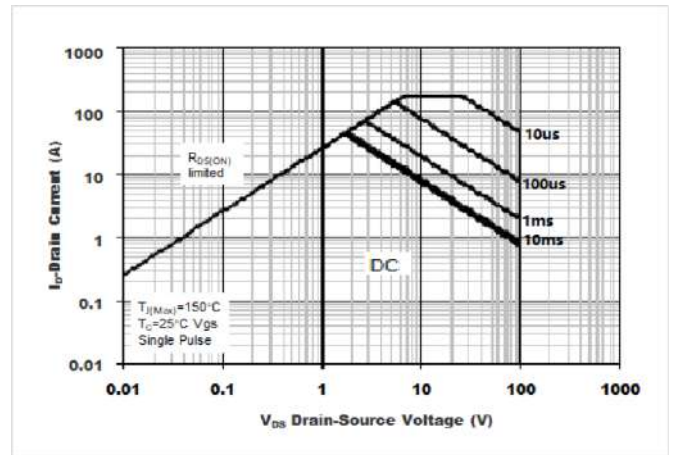


Figure8.Safe Operation Area

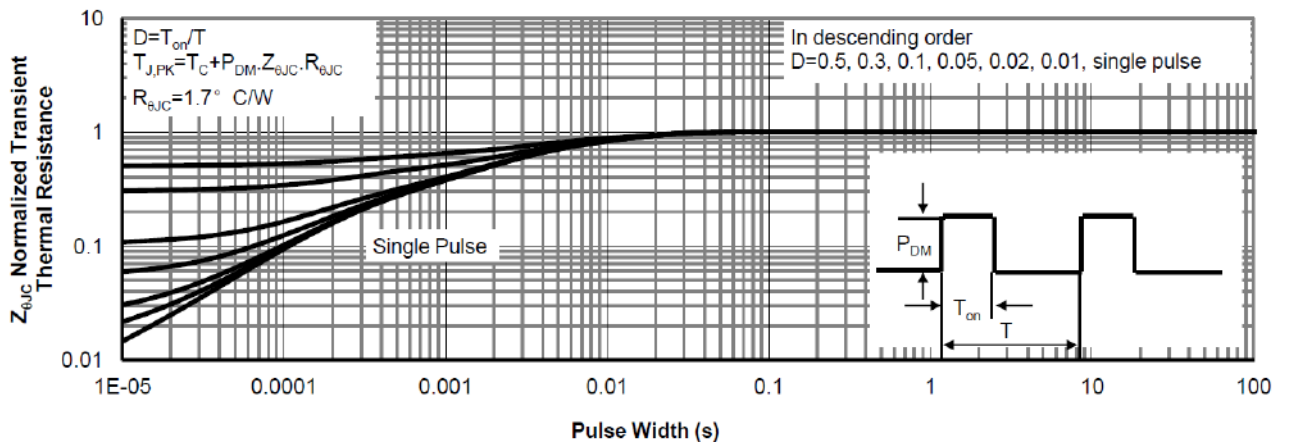
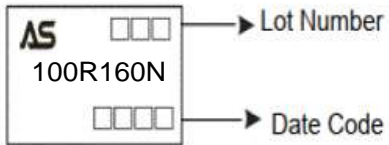


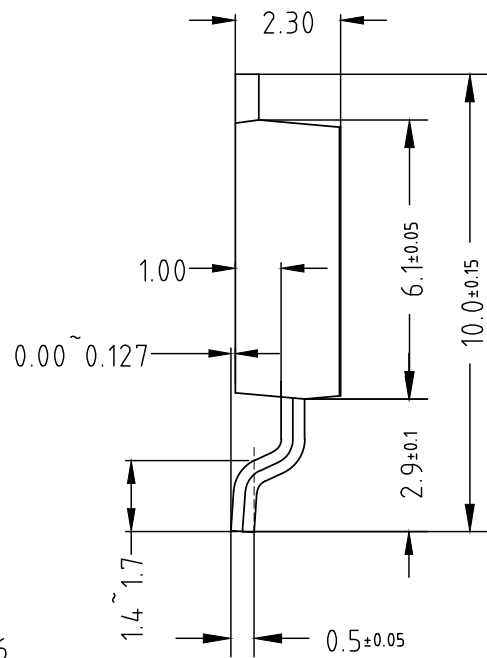
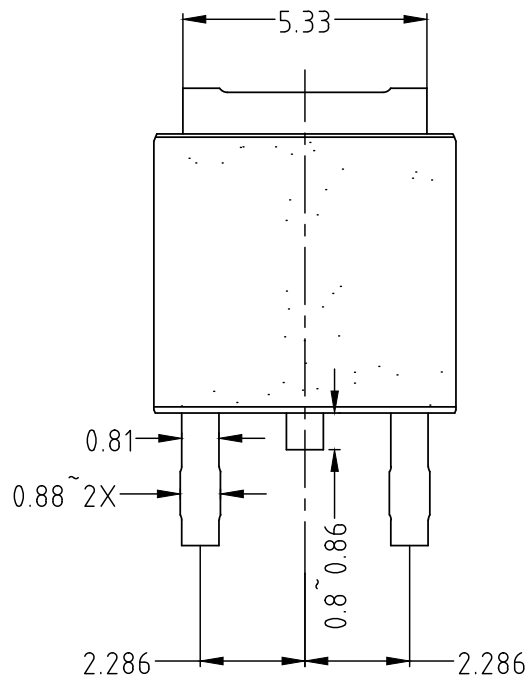
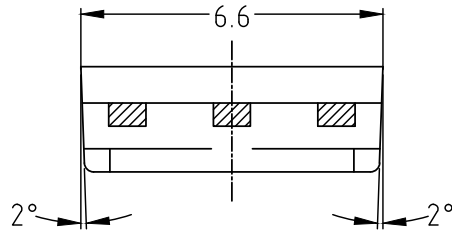
Figure9.Normalized Maximum Transient thermal impedance

### Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM100R160NKQ-R	100R160N	TO-252	Tape&Reel	2500/Reel

PACKAGE	MARKING
TO-252	 <p>AS □□□ → Lot Number      100R160N      □□□□ → Date Code</p>

### TO-252



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