

## General Features

- High density cell design for ultra low  $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high  $E_{AS}$
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

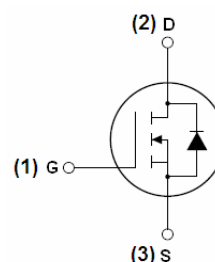
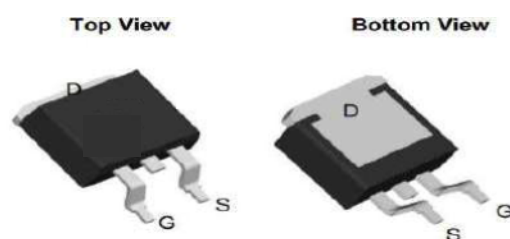
## Application

- Power switching application
- LED backlighting
- Uninterruptible power supply

## Product Summary



BVDSS	60	V
$R_{DS(on)}$ , Typ. @ $V_{GS}=10V$	6.4	m $\Omega$
$I_D$	80	A



TO-263

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	80	A
Drain Current-Continuous( $T_C=100^{\circ}C$ )	$I_D (100^{\circ}C)$	56	A
Pulsed Drain Current	$I_{DM}$	250	A
Maximum Power Dissipation	$P_D$	85	W
Debating factor		0.57	W/ $^{\circ}C$
Single pulse avalanche energy <sup>(Note 5)</sup>	$E_{AS}$	125	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 175	$^{\circ}C$

## Thermal Characteristic

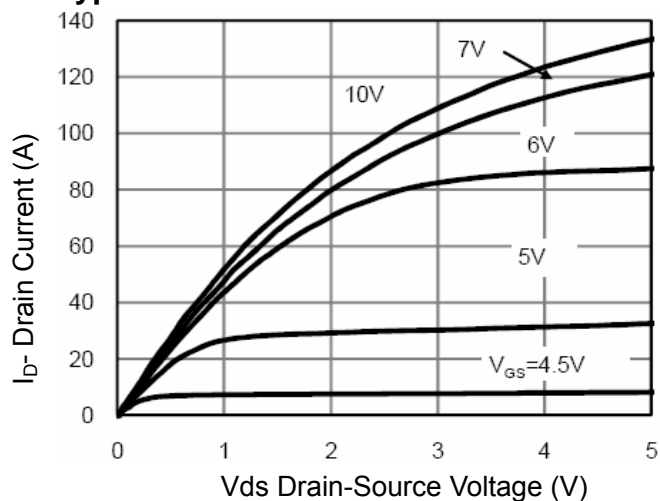
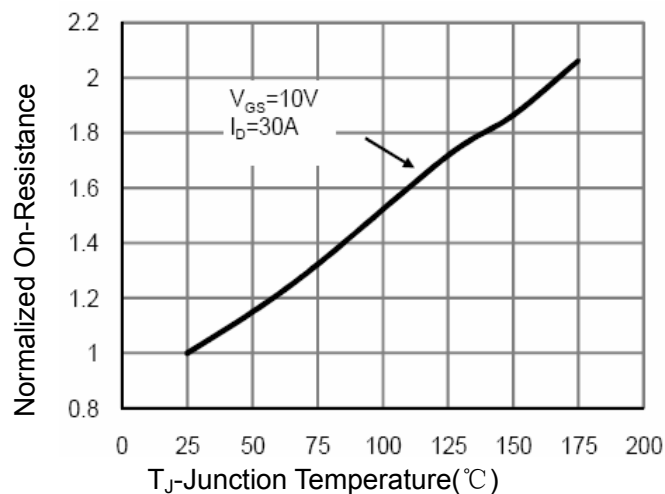
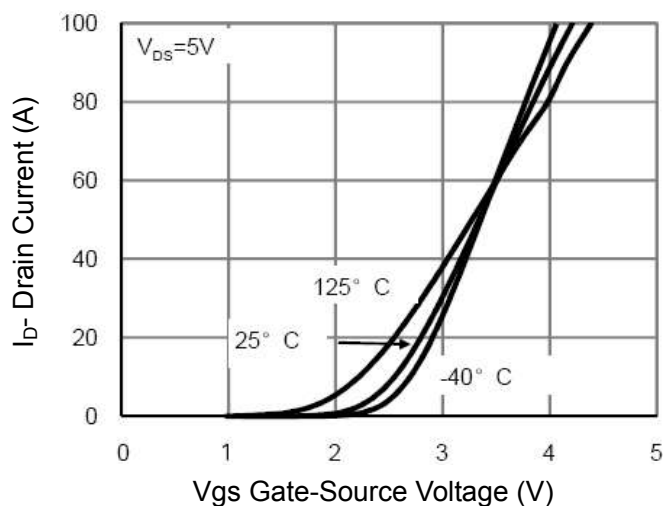
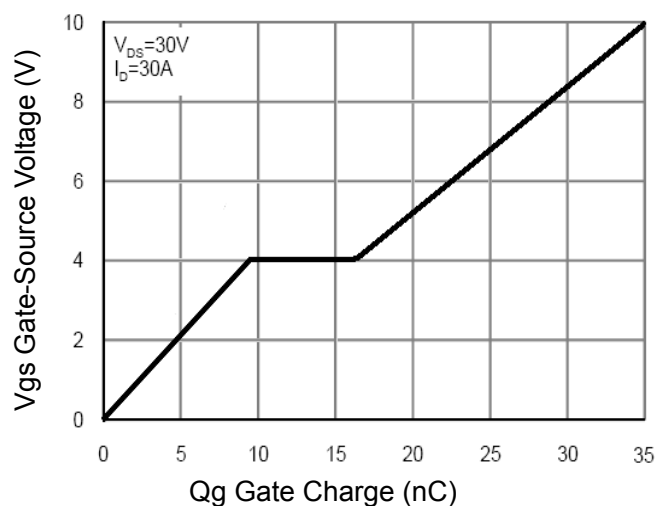
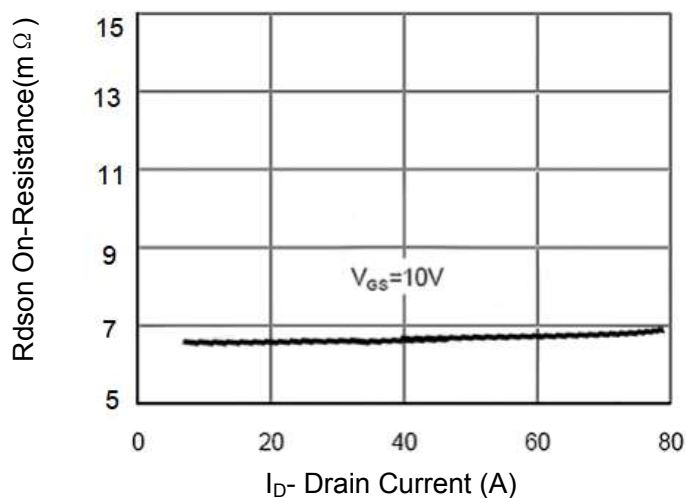
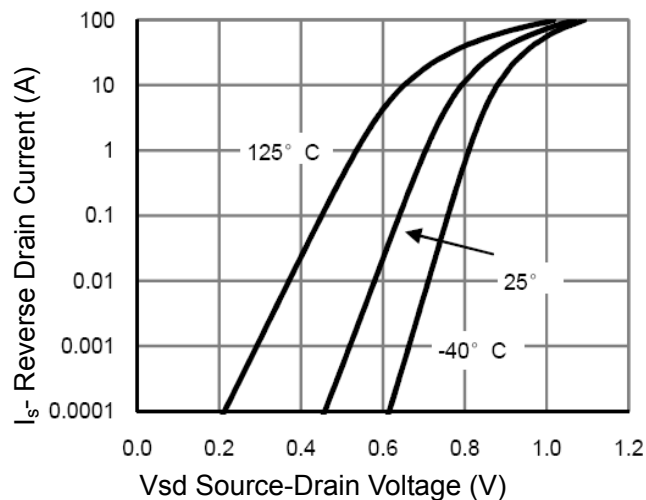
Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup>	$R_{\theta JA}$	62	$^{\circ}C/W$
Thermal Resistance, Junction-to-Case <sup>(Note 2)</sup>	$R_{\theta JC}$	0.76	$^{\circ}C/W$

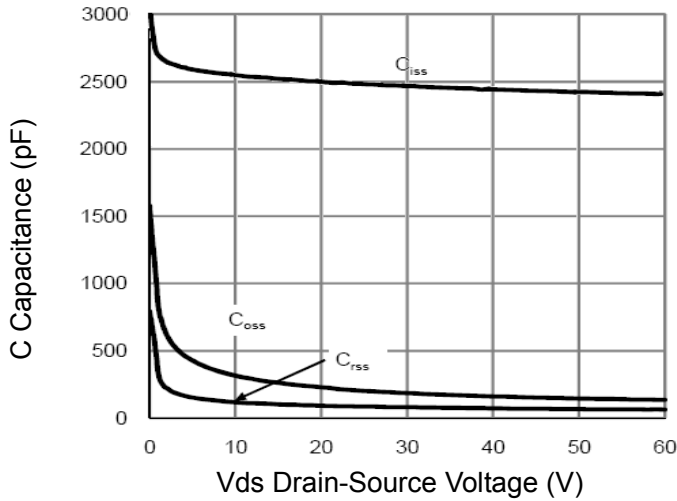
**Electrical Characteristics (T<sub>C</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V I <sub>D</sub> =250μA	60	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
On Characteristics <sup>(Note 3)</sup>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	2.8	4	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	6.4	10	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =30A	30	-	-	S
Dynamic Characteristics <sup>(Note4)</sup>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, F=1.0MHz	-	2498	-	PF
Output Capacitance	C <sub>OSS</sub>		-	185	-	PF
Reverse Transfer Capacitance	C <sub>RSS</sub>		-	80	-	PF
Switching Characteristics <sup>(Note 4)</sup>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, I <sub>D</sub> =2A, R <sub>L</sub> =1Ω V <sub>GS</sub> =10V, R <sub>GEN</sub> =3Ω	-	12	-	nS
Turn-on Rise Time	t <sub>r</sub>		-	5.2	-	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	38	-	nS
Turn-Off Fall Time	t <sub>f</sub>		-	27	-	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =30V, I <sub>D</sub> =30A, V <sub>GS</sub> =10V	-	36	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	9.9	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	6.6	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage <sup>(Note 3)</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A	-	-	1.4	V
Diode Forward Current <sup>(Note 2)</sup>	I <sub>S</sub>		-	-	80	A
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> =30A di/dt = 100A/μs <sup>(Note3)</sup>	-	35		nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	47		nC
Forward Turn-On Time	t <sub>on</sub>	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

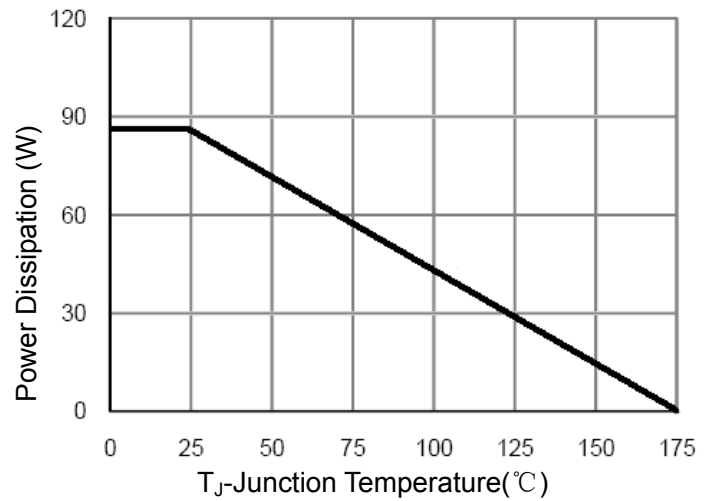
**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. E<sub>AS</sub> condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, L=0.5mH, R<sub>g</sub>=25Ω

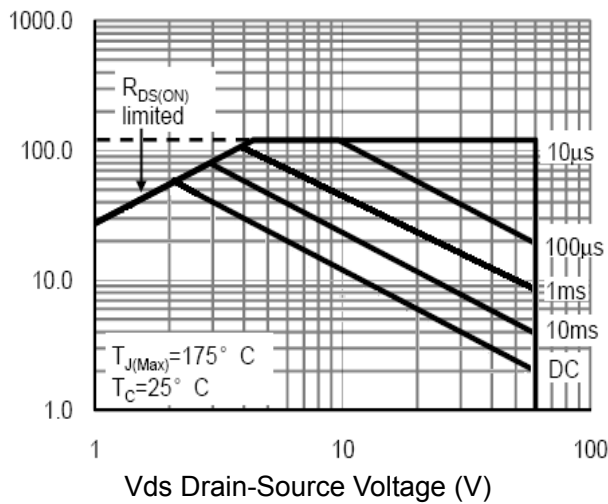
**Typical Electrical and Thermal Characteristics (Curves)**

**Figure 1 Output Characteristics**

**Figure 4 Rdson-Junction Temperature**

**Figure 2 Transfer Characteristics**

**Figure 5 Gate Charge**

**Figure 3 Rdson- Drain Current**

**Figure 6 Source- Drain Diode Forward**



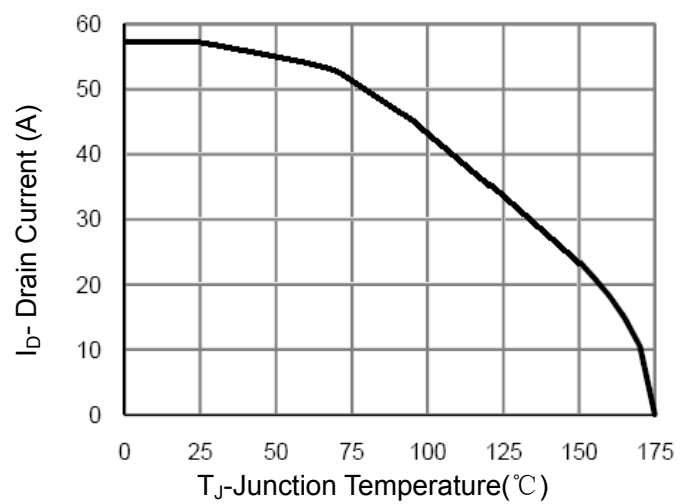
**Figure 7 Capacitance vs Vds**



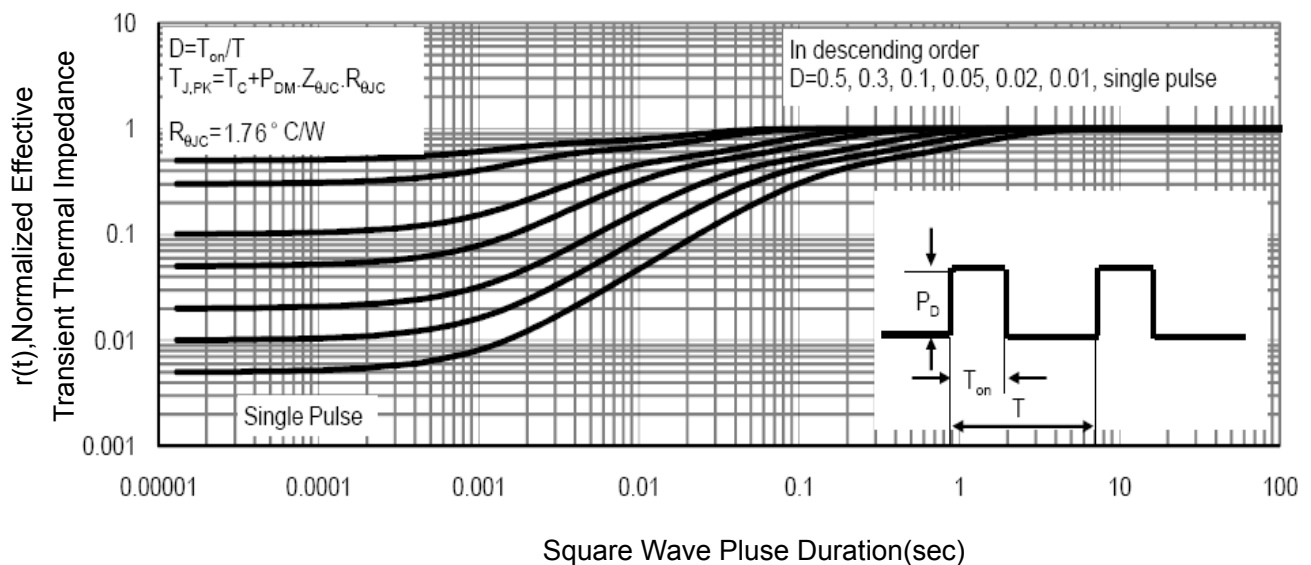
**Figure 9 Power De-rating**



**Figure 8 Safe Operation Area**



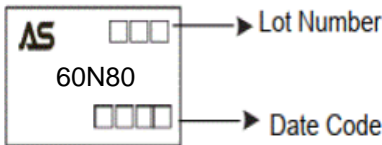
**Figure 10 ID Current- Junction Temperature**



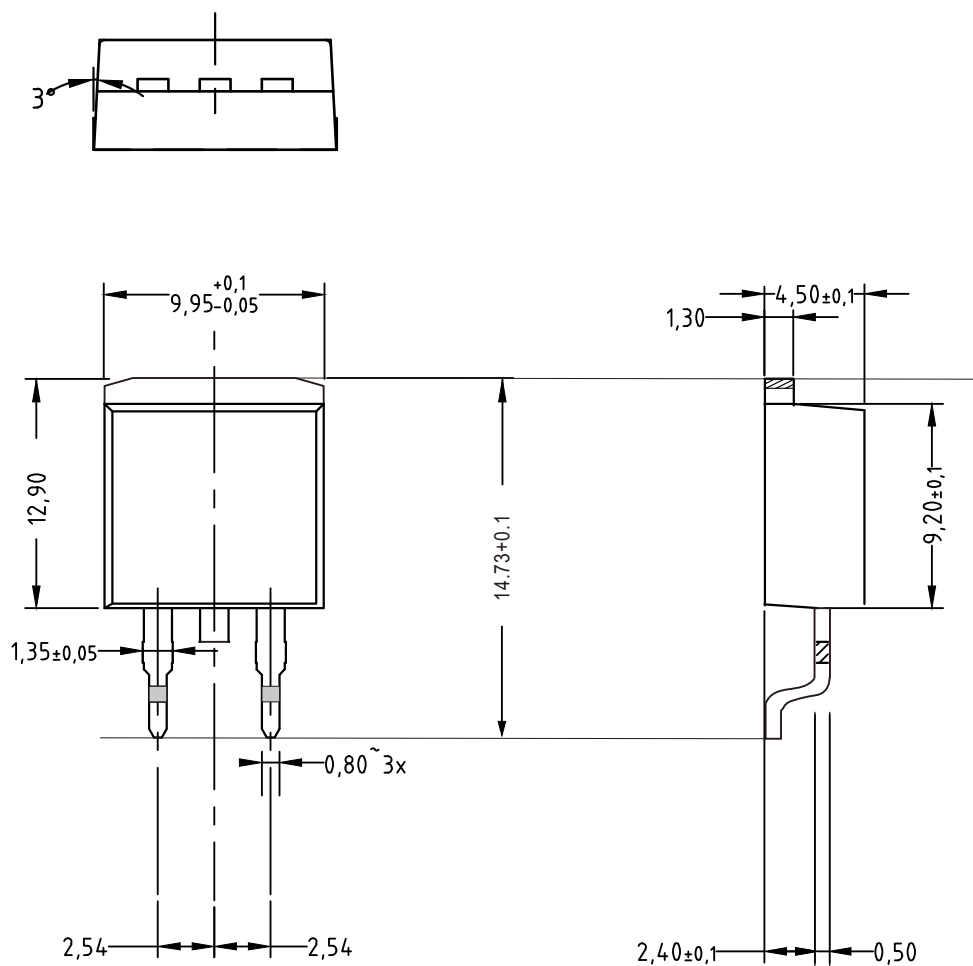
**Figure 11 Normalized Maximum Transient Thermal Impedance**

## Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM60N80G-R	60N80	TO-263	Reel&Tape	800/Reel

PACKAGE	MARKING
TO-263	 <p>The diagram shows a rectangular marking area on a TO-263 package. It contains the ASDsemi logo (AS), the part number 60N80, and two sets of three squares. An arrow points from the top set of squares to the text 'Lot Number', and another arrow points from the bottom set of squares to the text 'Date Code'.</p>

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