

Features

- High density cell design for ultra low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

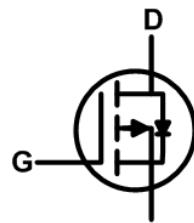
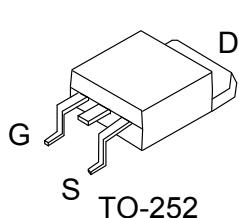
Applications

- Load switch
- PWM application

Product Summary



V_{DS}	-60	V
$R_{DS(on),max} @ V_{GS}=10V$	70	$m\Omega$
I_D	-12	A



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}	± 20	V
Drain Current-Continuous	I_D	-12	A
Pulsed Drain Current	I_{DM}	-48	A
Maximum Power Dissipation	P_D	50	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	°C

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	R_{JC}	3.0	°C/W
Thermal Resistance, Junction-to-Ambient	R_{JA}	50	°C/W

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=-250\mu\text{A}$	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{\text{DS}}=-60\text{V}, V_{\text{GS}}=0\text{V}$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=-250\mu\text{A}$	-1.0	1.9	-2.5	V
Drain-Source On-State Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-14\text{A}$	-	62	70	$\text{m}\Omega$
		$V_{\text{GS}}=-4.5\text{V}, I_{\text{D}}=-10\text{A}$	-	78	90	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{\text{DS}}=-5\text{V}, I_{\text{D}}=-14\text{A}$	-	10	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{iss}	$V_{\text{DS}}=-30\text{V}, V_{\text{GS}}=0\text{V}, F=1.0\text{MHz}$	-	968	-	PF
Output Capacitance	C_{oss}		-	88	-	PF
Reverse Transfer Capacitance	C_{rss}		-	36	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=-30\text{V}, R_{\text{L}}=2\Omega, V_{\text{GS}}=-10\text{V}, R_{\text{G}}=3\Omega$	-	8	-	nS
Turn-on Rise Time	t_{r}		-	4	-	nS
Turn-Off Delay Time	$t_{\text{d}(\text{off})}$		-	32	-	nS
Turn-Off Fall Time	t_{f}		-	7	-	nS
Total Gate Charge	Q_{g}	$V_{\text{DS}}=-30, I_{\text{D}}=-14\text{A}, V_{\text{GS}}=-10\text{V}$	-	25	-	nC
Gate-Source Charge	Q_{gs}		-	3	-	nC
Gate-Drain Charge	Q_{gd}		-	7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{\text{GS}}=0\text{V}, I_{\text{S}}=-14\text{A}$	-		-1.2	V
Diode Forward Current (Note 2)	I_{S}		-	-	-12	A
Reverse Recovery Time	t_{rr}	$T_J = 25^\circ\text{C}, I_F = -14\text{A}$ $di/dt = -100\text{A}/\mu\text{s}$ (Note 3)	-	25		nS
Reverse Recovery Charge	Q_{rr}		-	31		nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Typical Performance Characteristics

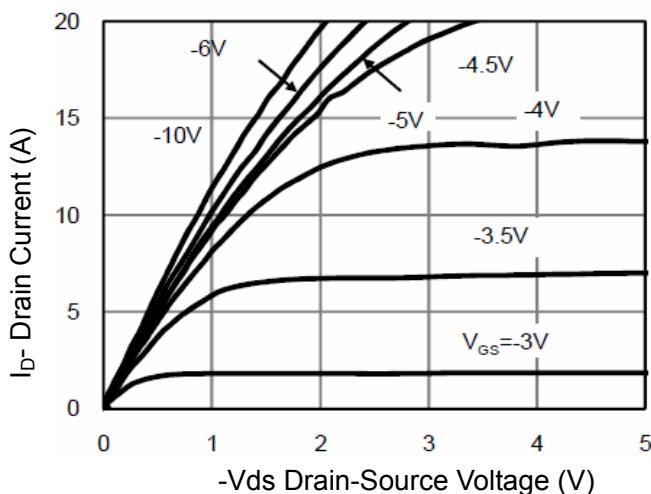


Figure 1 Output Characteristics

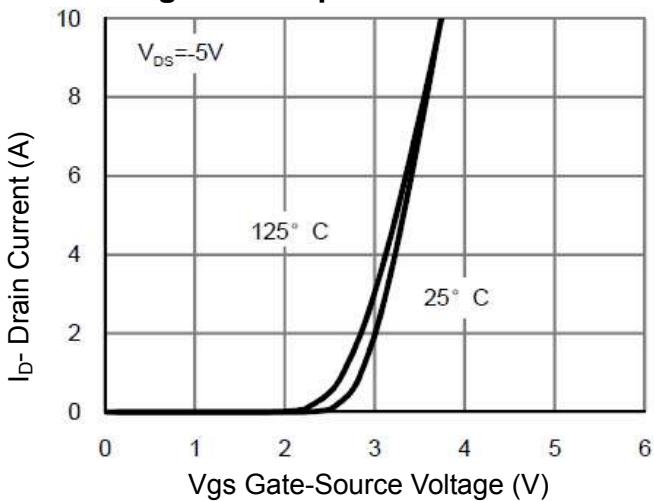


Figure 2 Transfer Characteristics

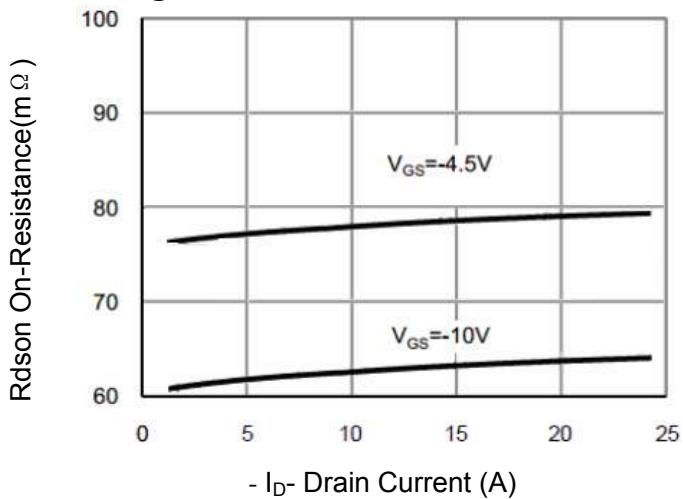


Figure 3 Rdson- Drain Current

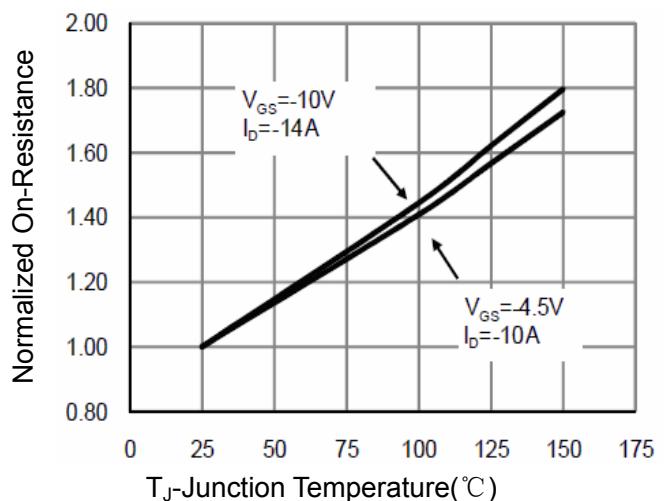


Figure 4 Rdson-Junction Temperature

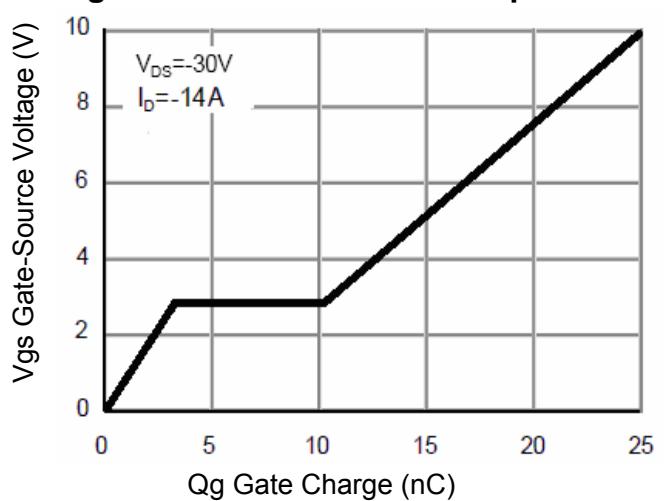


Figure 5 Gate Charge

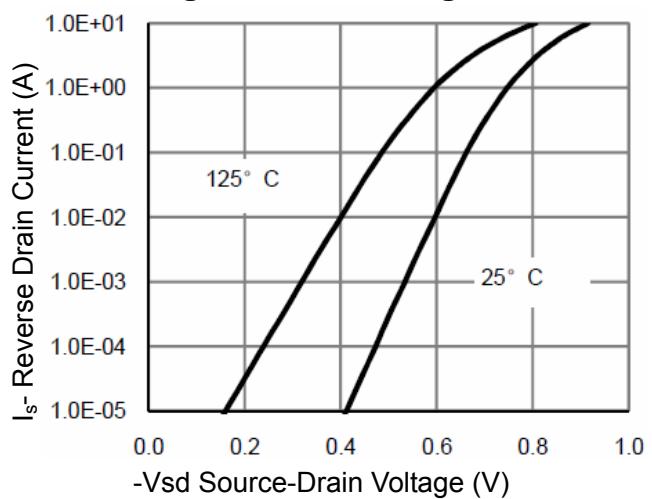
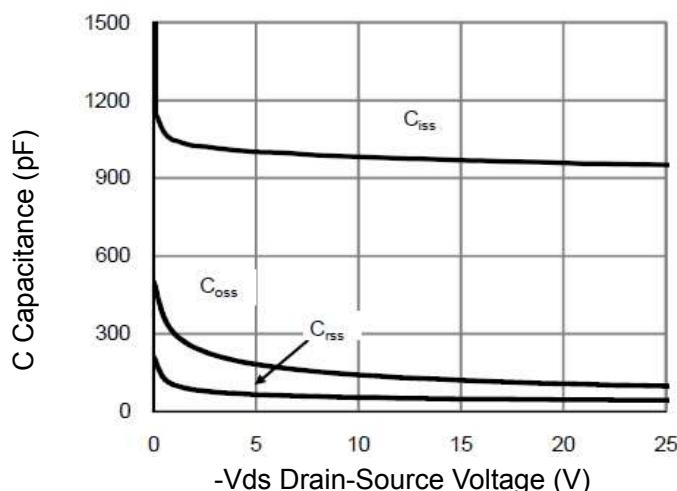
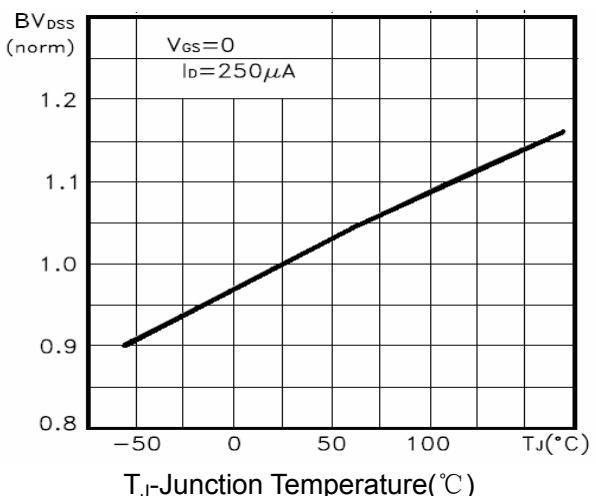
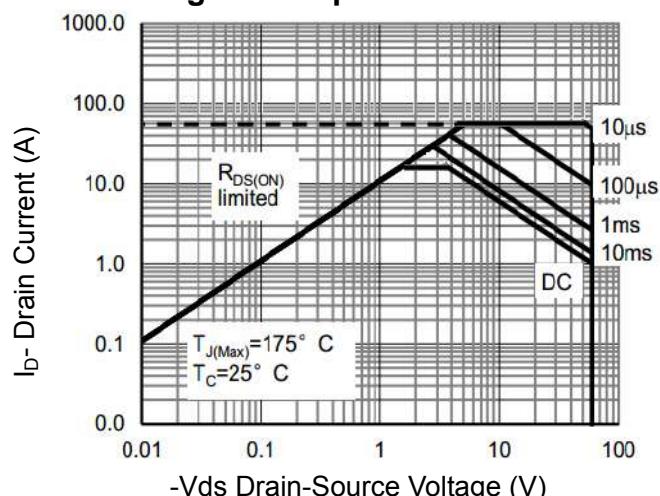
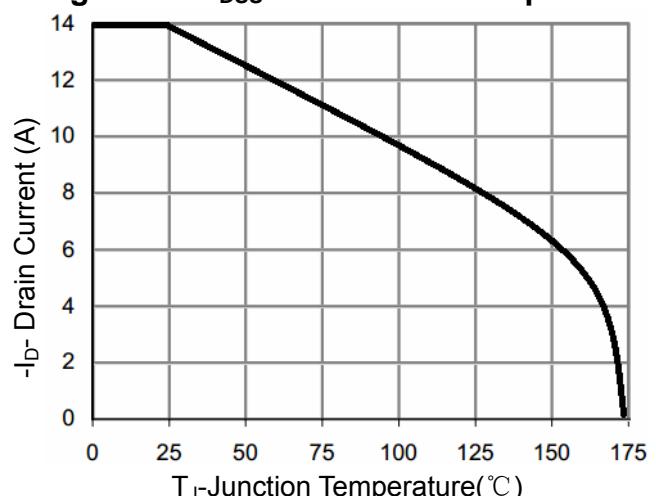
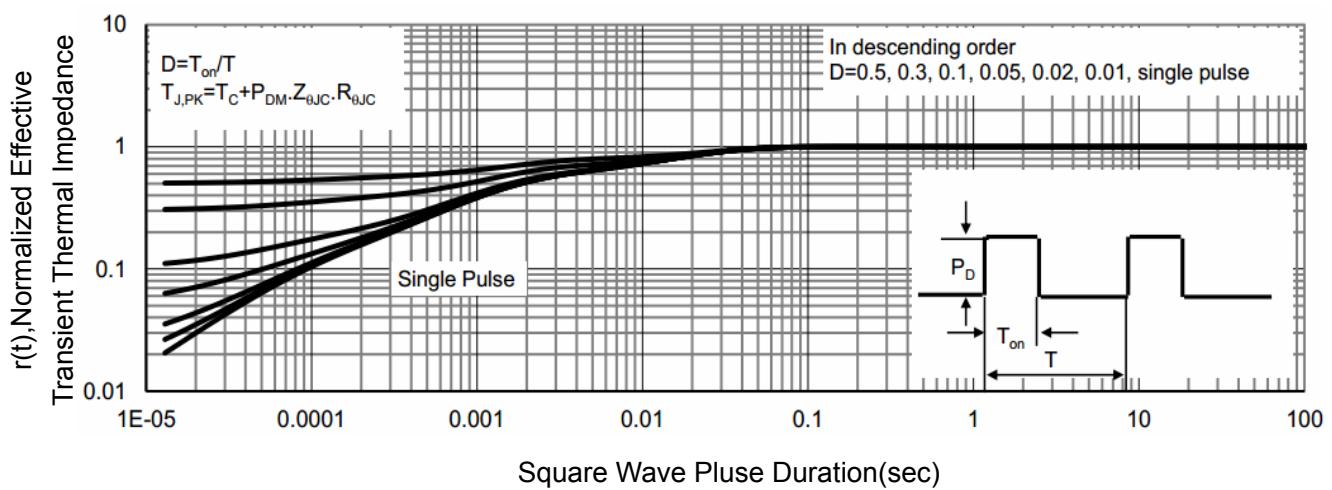
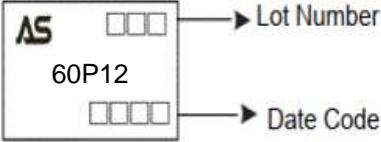


Figure 6 Source- Drain Diode Forward

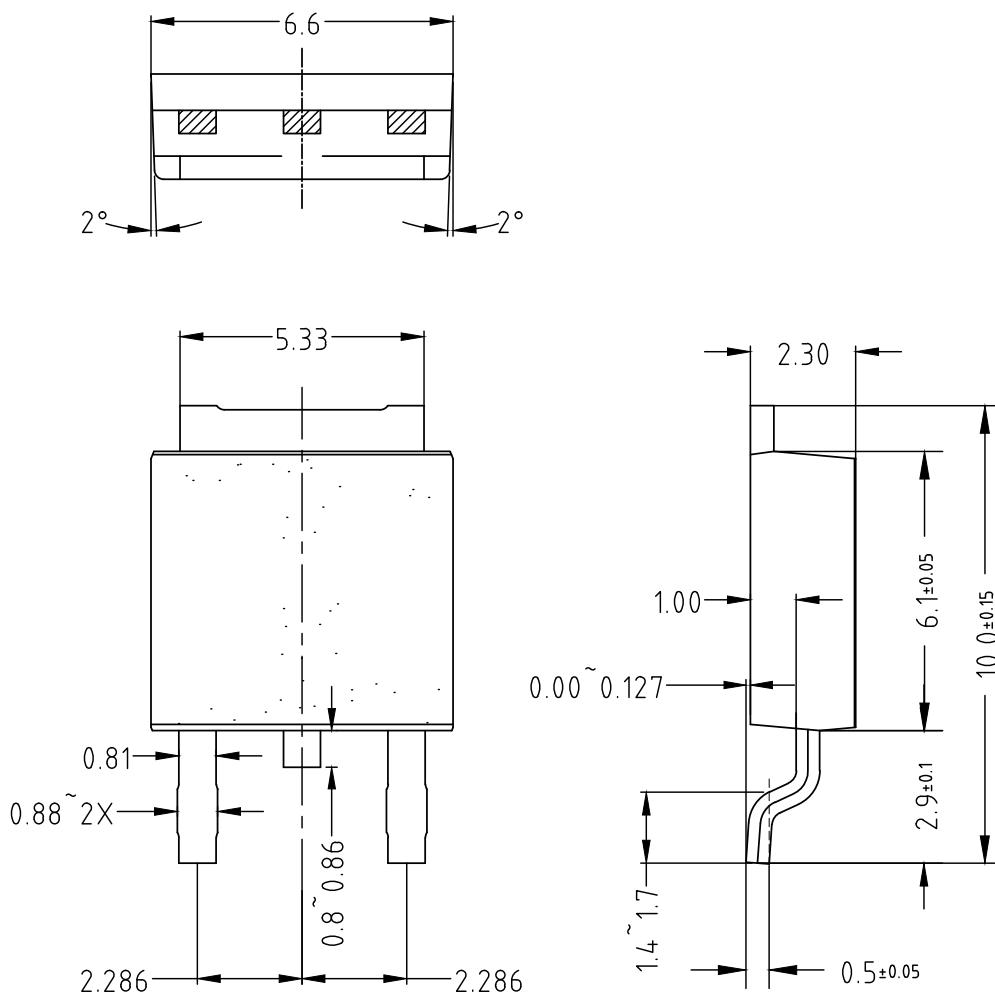

Figure 7 Capacitance vs Vds

Figure 9 BV_{DSS} vs Junction Temperature

Figure 8 Safe Operation Area

Figure 10 ID Current De-rating

Figure 11 Normalized Maximum Transient Thermal Impedance

Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM60P12KQ-R	60P12	TO-252	Tape&Reel	2500/ Reel

PACKAGE	MARKING
TO-252	

TO-252



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