

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
60V	3.7mΩ@10V	110A
	4.6mΩ@4.5V	

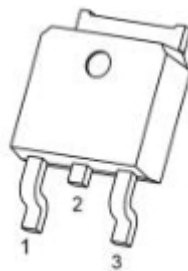
## Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

## Applications

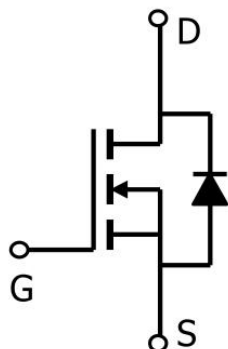
- DC-DC Converters
- Power Management

## Package



TO-252(1:G 2:D 3:S)

## Circuit diagram



## Marking



**60N03G**  
\*\*

**=Device Code**  
**=Week Code**

## Absolute maximum ratings

( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup> ( $T_c=25^{\circ}\text{C}$ )	$I_D$	110	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	440	A
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	756	mJ
Total Power Dissipation <sup>4</sup> ( $T_c=25^{\circ}\text{C}$ )	$P_D$	130	W
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	0.96	$^{\circ}\text{C}/\text{W}$
Storage Temperature Range	$T_{STG}$	-55~ +150	$^{\circ}\text{C}$
Operating Junction Temperature Range	$T_J$	-55~ +150	$^{\circ}\text{C}$

## Electrical characteristics

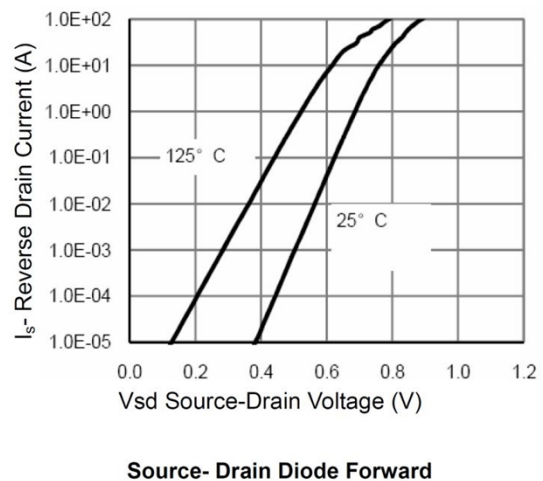
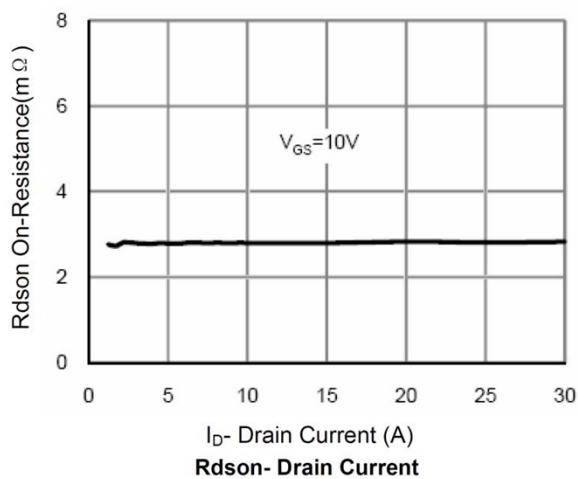
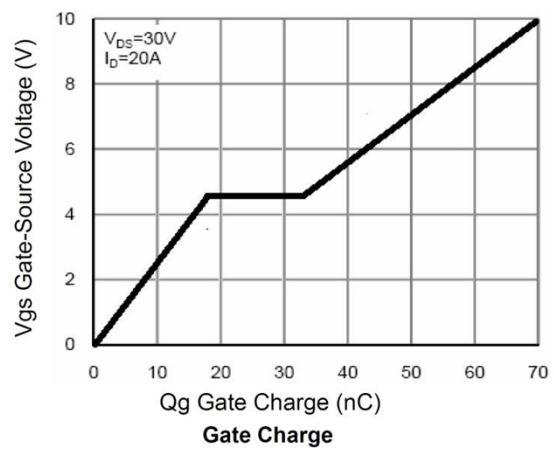
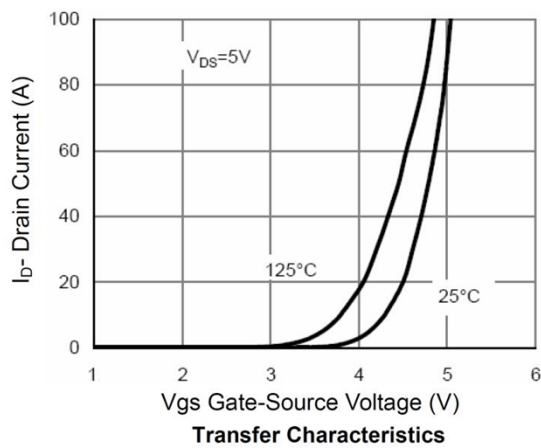
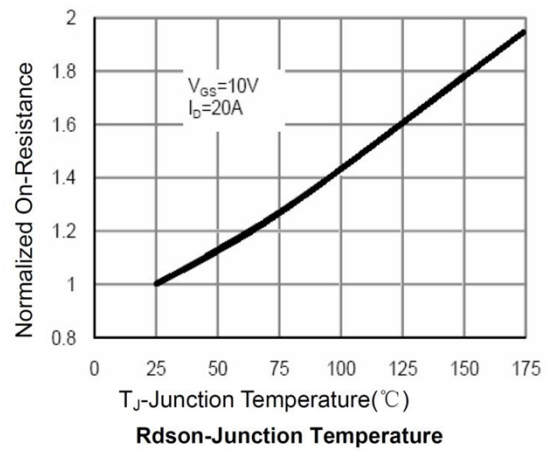
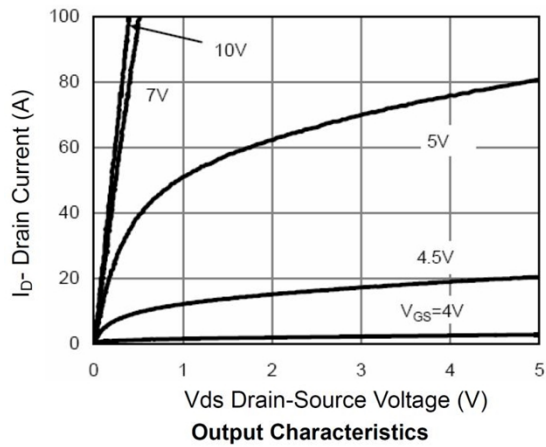
( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

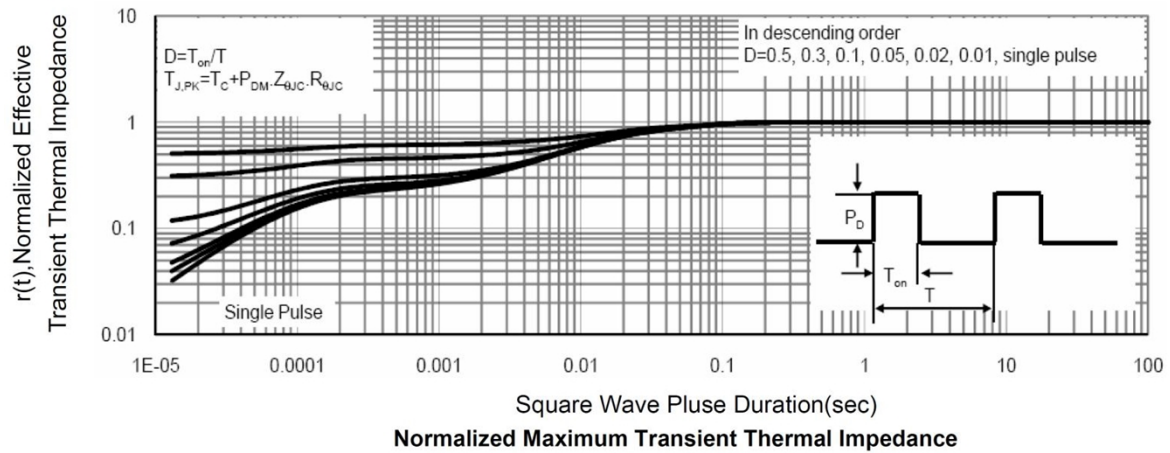
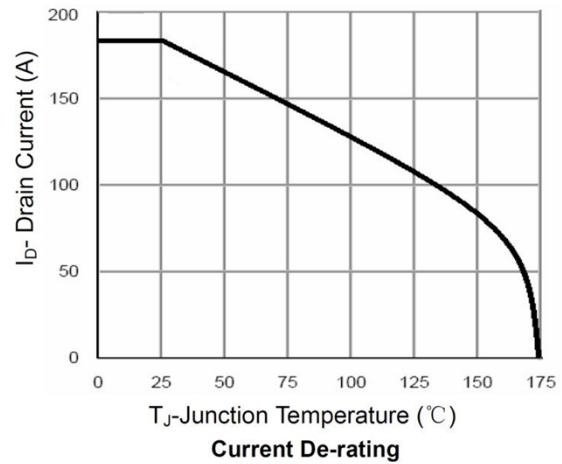
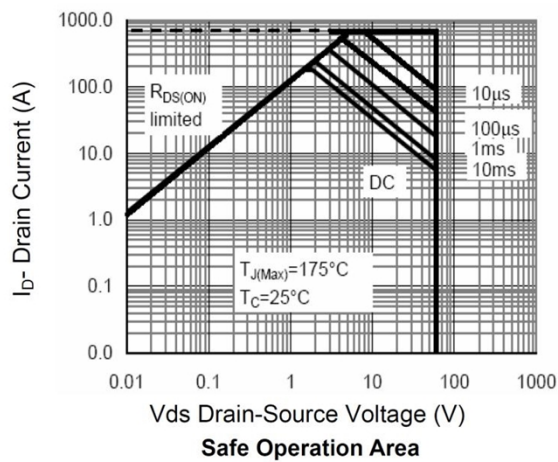
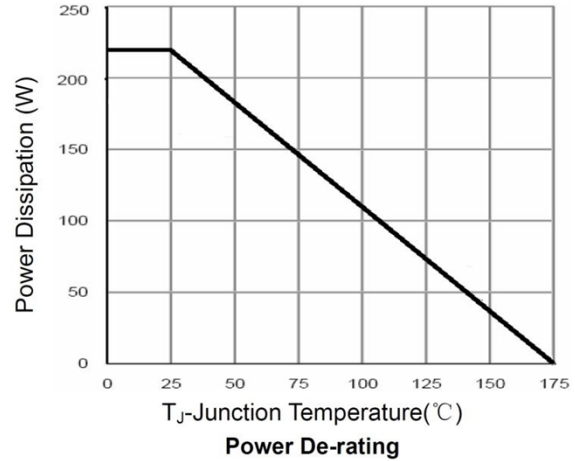
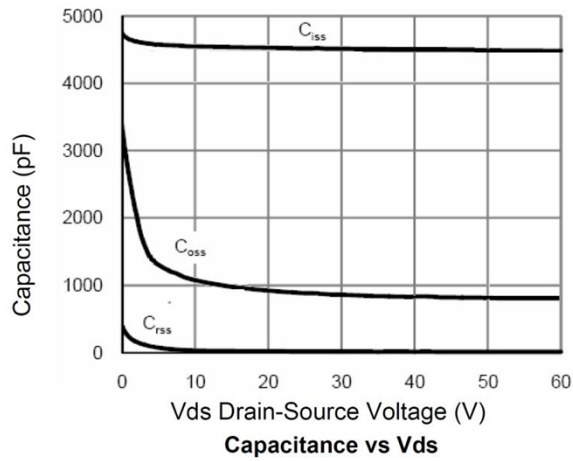
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	60			V
Drain-source leakage current	I <sub>DSS</sub>	V <sub>DS</sub> =48V,V <sub>GS</sub> = 0V			1	uA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V,V <sub>DS</sub> = 0V			±100	uA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.7	2.5	V
Drain-Source On-State Resistance <sup>2</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		3.7	4.7	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		4.6	6.2	
Dynamic Characteristics						
Input capacitance	C <sub>iSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz		4250		pF
Output capacitance	C <sub>oSS</sub>			975		
Reverse transfer capacitance	C <sub>rSS</sub>			41		
Switching Characteristics						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =30V , V <sub>GS</sub> =10V, I <sub>D</sub> =20A		68		pF
Gate-Source Charge	Q <sub>gs</sub>			19		
Gate-Drain Charge	Q <sub>gd</sub>			14		
Turn-on delay time	T <sub>d(on)</sub>	V <sub>DD</sub> =30V,V <sub>GS</sub> =10V, R <sub>G</sub> =4.7Ω, I <sub>D</sub> =20A		6		nS
Rise time	T <sub>r</sub>			12		
Turn-off delay time	T <sub>d(off)</sub>			24		
Fall time	T <sub>f</sub>			5		
Diode Characteristics						
Diode forward voltage <sup>2</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V ,I <sub>S</sub> =1A,T <sub>J</sub> =25℃			1.2	V

### Note :

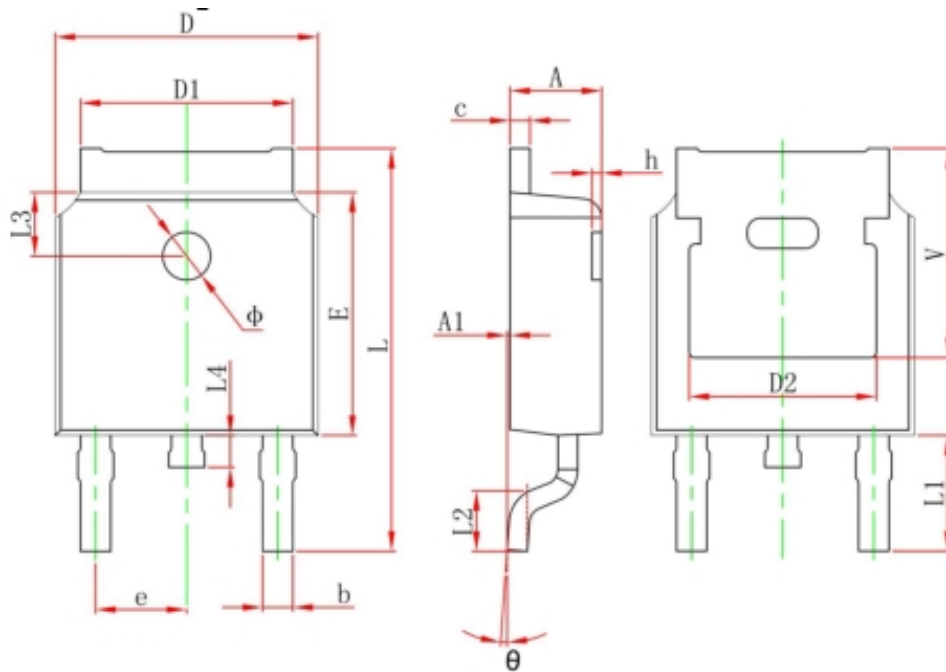
1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
3. The EAS data shows Max. rating . The test condition is  $V_{DD}=30V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$
4. The power dissipation is limited by  $150^{\circ}\text{C}$  junction temperature
5. The data is theoretically the same as  $I_D$  and  $I_{DM}$  , in real applications , should be limited by total power dissipation.

## Typical Characteristics





## TO-252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	