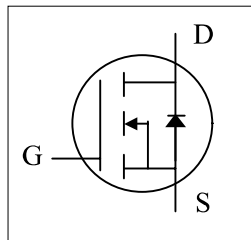


AP2055K

N-Channel Power MOSFET

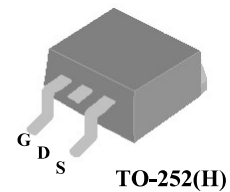
- ▼ Capable of 2.5V Gate Drive
- ▼ Small Size & Ultra_Low $R_{DS(ON)}$
- ▼ RoHS Compliant & Halogen-Free



BV_{DSS}	20V
$R_{DS(ON)}$	4.8m Ω
I_D^3	60A

Description

AP2055K series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_A=25^\circ\text{C}$	Drain Current, V_{GS} @ 4.5V ³	60	A
$I_D@T_A=70^\circ\text{C}$	Drain Current, V_{GS} @ 4.5V ³	40	A
I_{DM}	Pulsed Drain Current ¹	180	A
EAS	Single pulse avalanche energy	190	mJ
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	3.13	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	5	$^\circ\text{C}/\text{W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient ³	40	$^\circ\text{C}/\text{W}$

N-Channel Power MOSFET

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =4.5V, I _D =20A	-	4.8	5.5	mΩ
		V _{GS} =2.5V, I _D =12A	-	-	7	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =1mA	0.5	-	0.9	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =20A	-	30	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =16V, V _{GS} =0V	-	-	10	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge	I _D =20A	-	32	59.2	nC
Q _{gs}	Gate-Source Charge	V _{DS} =10V	-	6	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	6.5	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =10V	-	10	-	ns
t _r	Rise Time	I _D =1A	-	18	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω	-	30	-	ns
t _f	Fall Time	V _{GS} =5V	-	18	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	2200	4400	pF
C _{oss}	Output Capacitance	V _{DS} =10V	-	500	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	200	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1.4	2.8	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =2.5A, V _{GS} =0V	-	-	1.2	V
t _{rr}	Reverse Recovery Time	I _S =20A, V _{GS} =0V,	-	30	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	-	26	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² 2oz copper pad of FR4 board, t ≤10sec; 135°C/W when mounted on min. copper pad.
- 4.Maximum current limited by package.

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Typical Electrical and Thermal Characteristics (Curves)

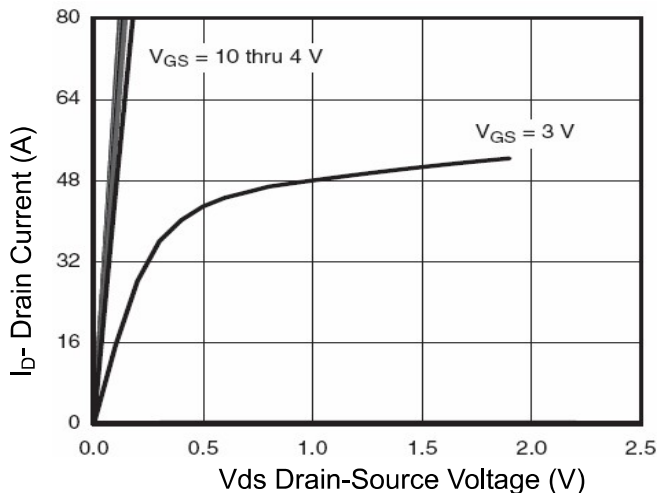


Figure 1 Output Characteristics

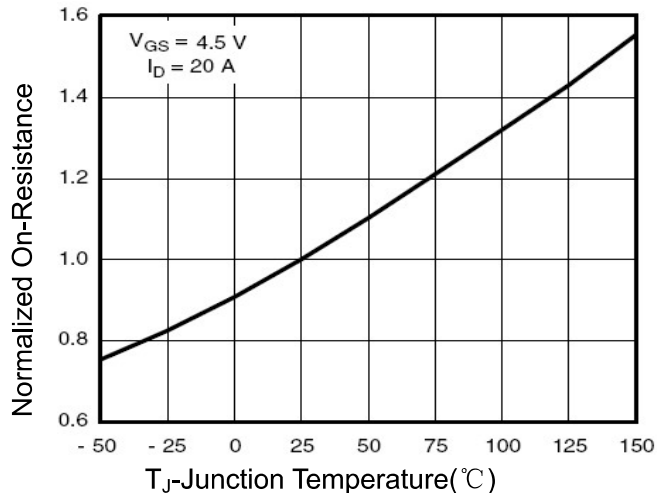


Figure 4 Rds(on)-Junction Temperature

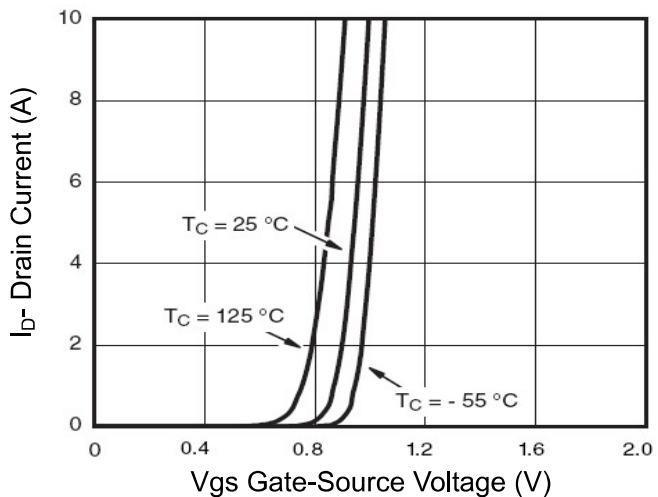


Figure 2 Transfer Characteristics

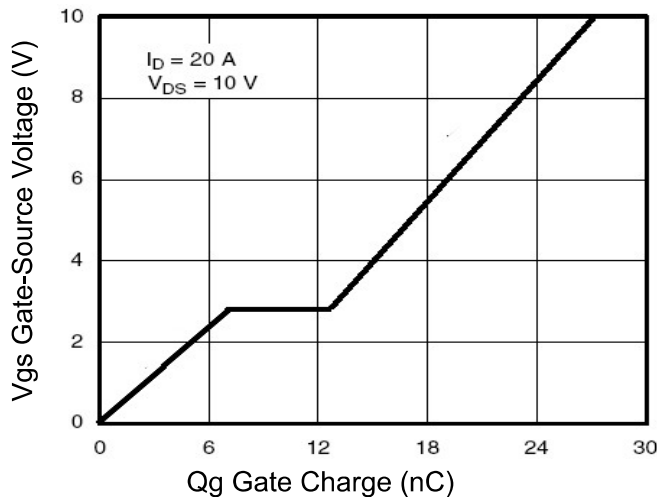


Figure 5 Gate Charge

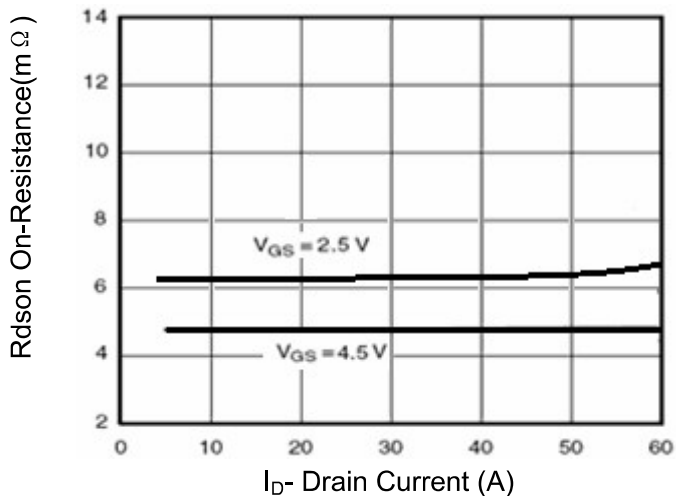


Figure 3 Rds(on)- Drain Current

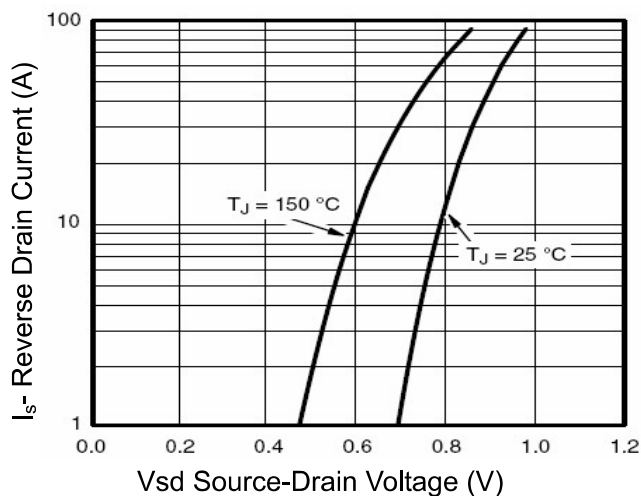


Figure 6 Source- Drain Diode Forward

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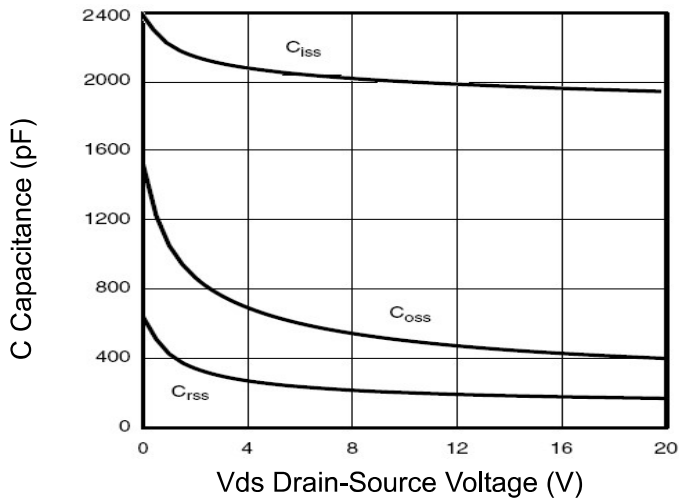


Figure 7 Capacitance vs Vds

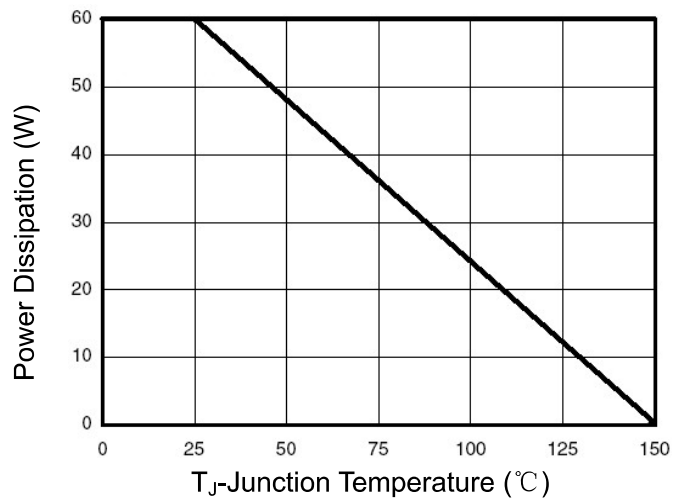


Figure 9 Power De-rating

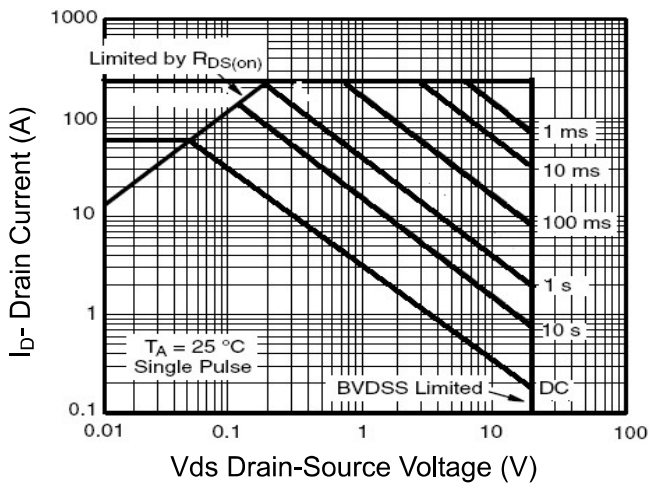


Figure 8 Safe Operation Area

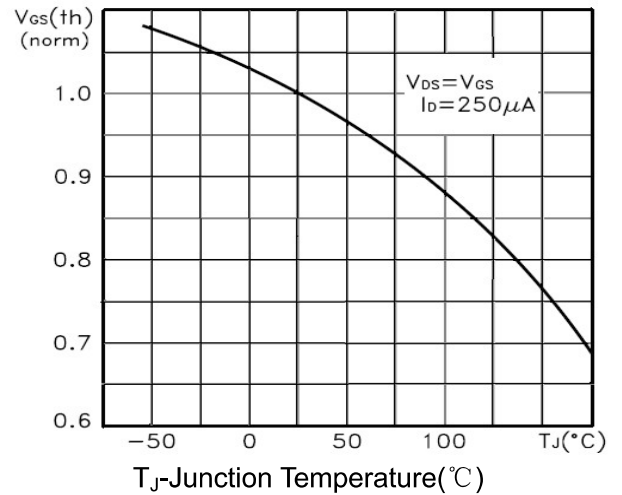


Figure 10 VGS(th) vs Junction Temperature

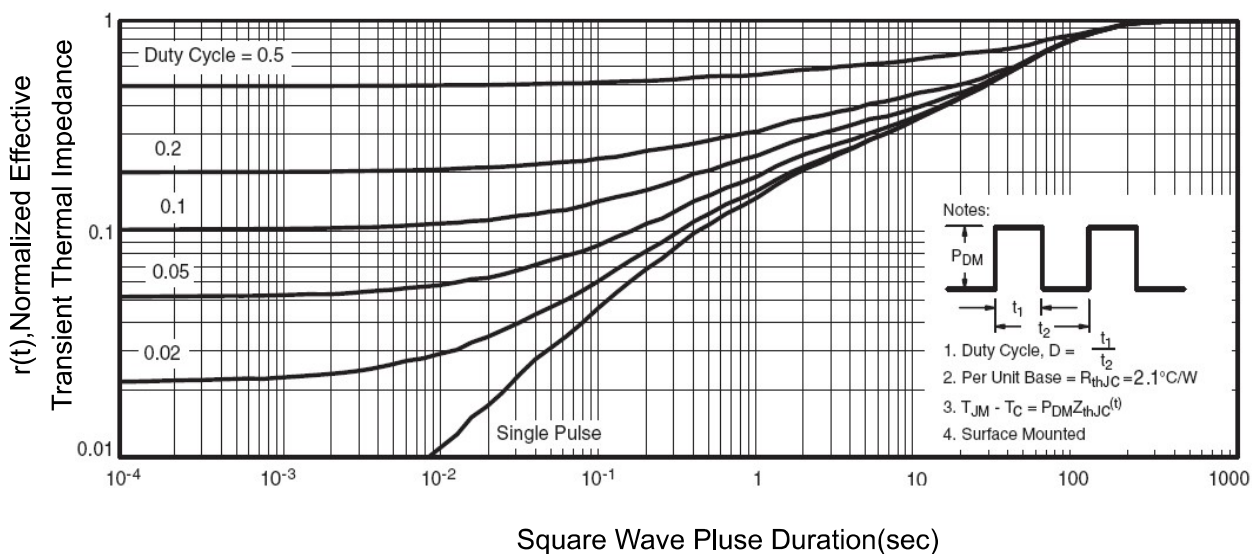
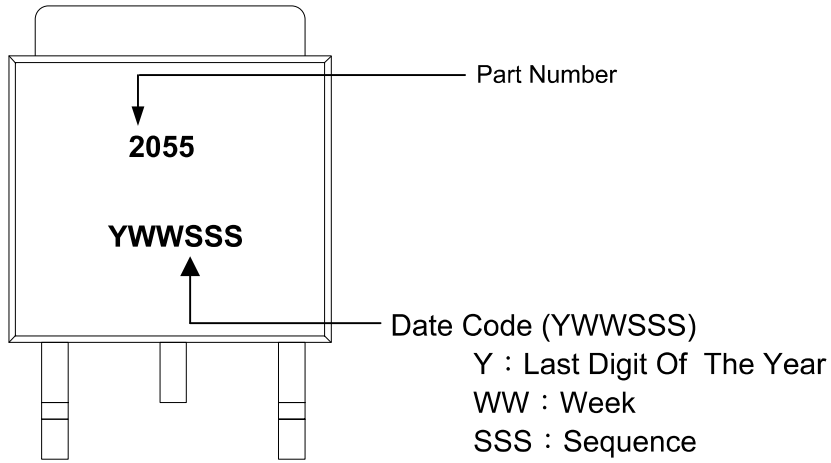


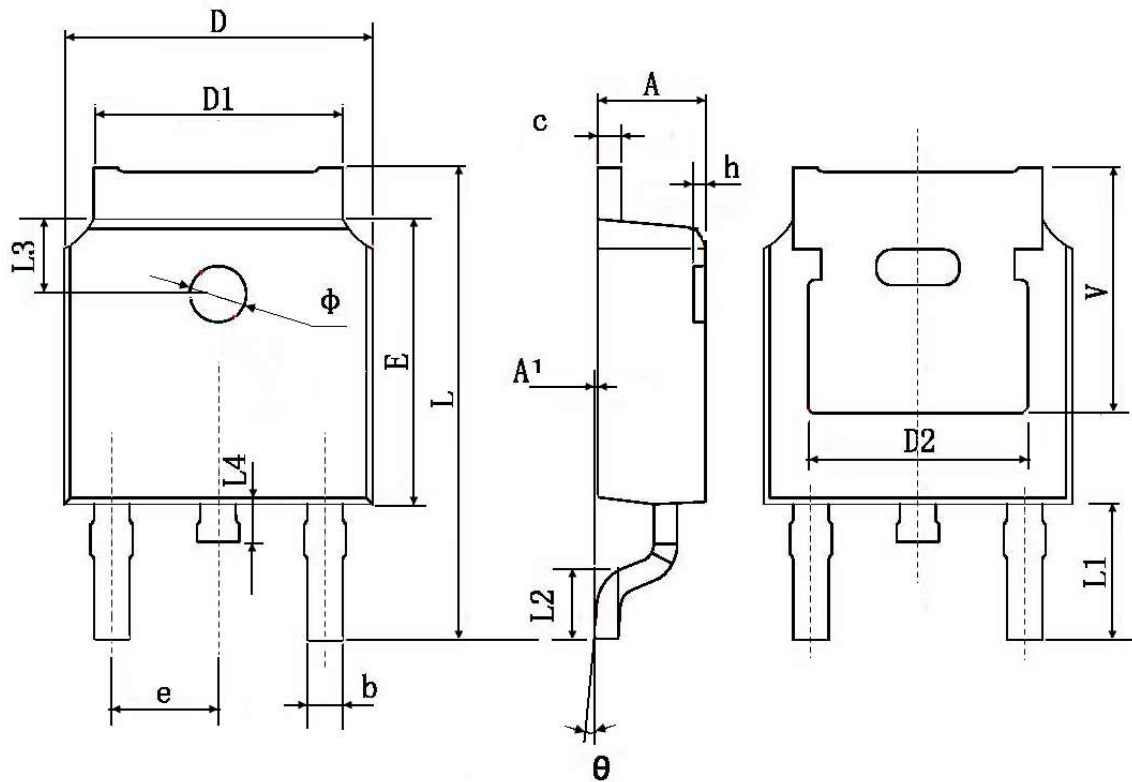
Figure 11 Normalized Maximum Transient Thermal Impedance

AP2055K

N-Channel Power MOSFET

TO-252



AP2055K
N-Channel Power MOSFET
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 TYP.		0.190 TYP.	
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 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
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 TYP.		0.211 TYP.	