

NCE5558K-VB Datasheet

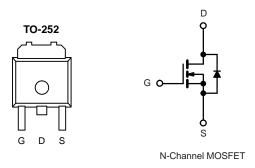
N-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY					
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A) ^a			
60	0.010 at V _{GS} = 10 V	58			
00	0.013 at V _{GS} = 4.5 V	56			



- 175 °C Junction Temperature
- Trench Power MOSFET
- Material categorization:





ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)						
Parameter		Symbol Limit		Unit		
Gate-Source Voltage		V _{GS}	± 20	V		
Continuous Desig Connect (T 475 °C)	T _C = 25 °C		58			
Continuous Drain Current (T _J = 175 °C) ^b	T _C = 100 °C		48 ^a			
Pulsed Drain Current	I _{DM}	100	А			
Continuous Source Current (Diode Conduction)	۱ _S	50 ^a				
Avalanche Current	I _{AS}	50				
Single Avalanche Energy (Duty Cycle \leq 1 %)	L = 0.1 mH	E _{AS}	125	mJ		
Maximum Dawar Dissingtion	T _C = 25 °C	P _D	136	w		
Maximum Power Dissipation	T _A = 25 °C		3 ^b , 8.3 ^{b, c}	VV		
Operating Junction and Storage Temperature Range	T _J , T _{stq}	- 55 to 175	°C			

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	$t \le 10 \text{ sec}$	- R _{thJA}	15	18	°C/W	
Maximum Junction-to-Ambient*	Steady State		40	50		
Maximum Junction-to-Case		R _{thJC}	0.85	1.1		

Notes:

a. Package limited.

b. Surface mounted on 1" x 1" FR4 board.

c. t \leq 10 s.



Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit	
Static		1					
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, \text{ I}_{D} = 250 \mu\text{A}$	60			v	
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	1	2	3	v	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
		$V_{DS} = 60 \text{ V}, V_{GS} = 0 \text{ V}$			1		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V, T _J = 125 °C			50	μA	
		$V_{DS} = 60 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \text{ T}_{J} = 175 \text{ °C}$			250		
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	60			А	
		V _{GS} = 10 V, I _D = 20 A	0.010				
	Б	V _{GS} = 10 V, I _D = 20 A, T _J = 125 °C		0.016		Ω	
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A, T _J = 175 °C		0.020			
		V _{GS} = 4.5 V, I _D = 15 A		0.013			
Forward Transconductance ^b	9 _{fs}	V _{DS} = 15 V, I _D = 20 A		60		S	
Dynamic	•						
Input Capacitance	C _{iss}			2650			
Output Capacitance	C _{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		470		pF	
Reverse Transfer Capacitance	C _{rss}			225			
Total Gate Charge ^c	Qg			47	70		
Gate-Source Charge ^c	Q _{gs}	V_{DS} = 30 V, V_{GS} = 10 V, I_D = 50 A		10		nC	
Gate-Drain Charge ^c	Q _{gd}			12		1	
Turn-On Delay Time ^c	t _{d(on)}			10	20		
Rise Time ^c	t _r	V_{DD} = 30 V, R_L = 0.6 Ω		15	25	ns	
Turn-Off Delay Time ^c	t _{d(off)}	$\text{I}_\text{D}\cong$ 50 A, V_GEN = 10 V, R_g = 2.5 Ω		35	50		
Fall Time ^c	t _f			20	30		
Source-Drain Diode Ratings and Cha	aracteristics (T _C = 25 °C)					
Pulsed Current	I _{SM}				60	А	
Diode Forward Voltage	V _{SD}	I _F = 20 A, V _{GS} = 0 V		1	1.5	V	
	t _{rr}	I _F = 20 A, di/dt = 100 A/μs		45			

SPECIFICATIONS (T₁ = 25 °C, unless otherwise noted)

Notes:

a. For design aid only; not subject to production testing.

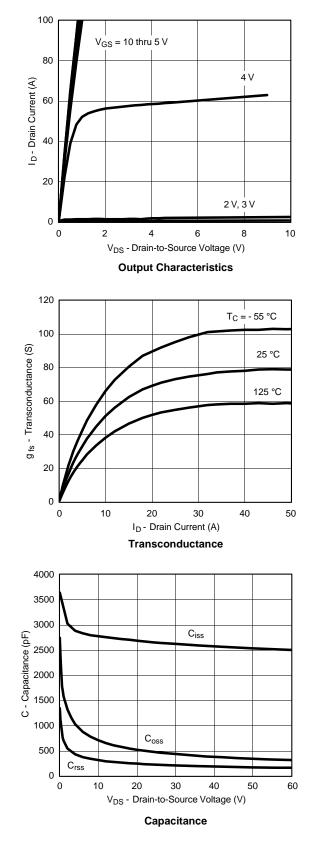
b. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 %.

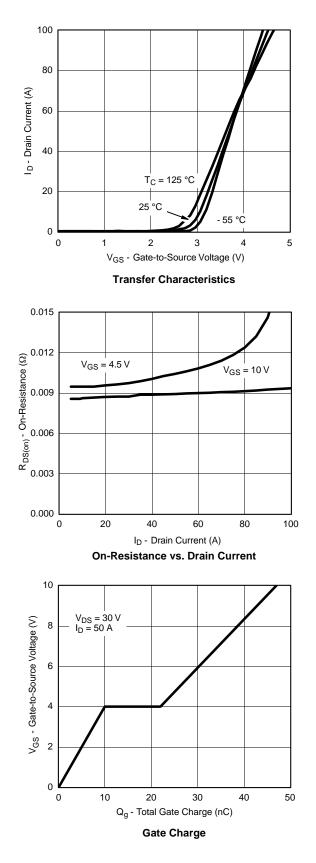
c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



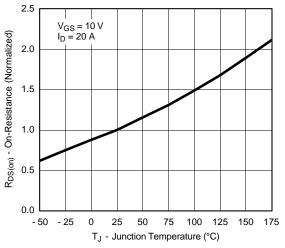
TYPICAL CHARACTERISTICS (25 °C unless noted)



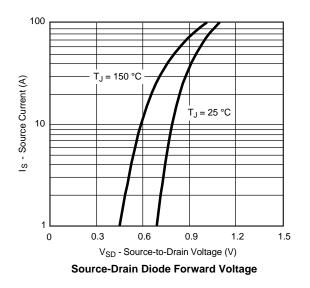




TYPICAL CHARACTERISTICS (25 °C unless noted)

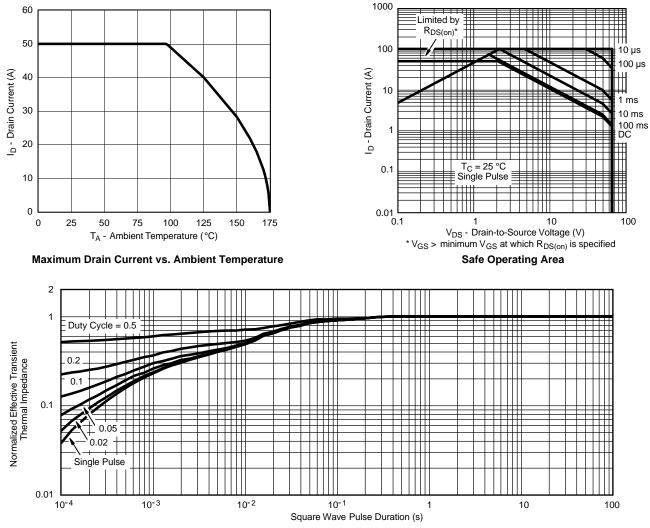


On-Resistance vs. Junction Temperature





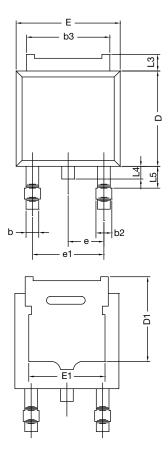
THERMAL RATINGS

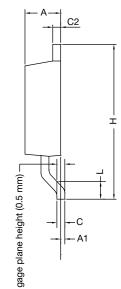


Normalized Thermal Transient Impedance, Junction-to-Case



TO-252AA CASE OUTLINE





	MILLIN	METERS	INC	HES		
DIM.	MIN.	MAX.	MIN.	MAX.		
А	2.18	2.38	0.086	0.094		
A1	-	0.127	-	0.005		
b	0.64	0.88	0.025	0.035		
b2	0.76	1.14	0.030	0.045		
b3	4.95	5.46	0.195	0.215		
С	0.46	0.61	0.018	0.024		
C2	0.46	0.89	0.018	0.035		
D	5.97	6.22	0.235	0.245		
D1	5.21	-	0.205	-		
Е	6.35	6.73	0.250	0.265		
E1	4.32	-	0.170	-		
Н	9.40	10.41	0.370	0.410		
е	2.28	BSC 0.090 BSC				
e1	4.56 BSC		0.180 BSC			
L	1.40	1.78	0.055	0.070		
L3	0.89	1.27	0.035	0.050		
L4	-	1.02	-	0.040		
L5	1.14	1.52	0.045	0.060		
ECN: X12-0247-Rev. M, 24-Dec-12 DWG: 5347						

Note

• Dimension L3 is for reference only.



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