

Description

This new generation MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$), yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

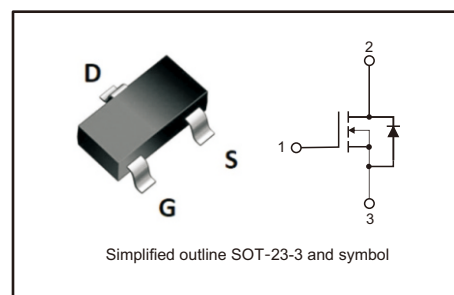
- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

Features

- Low On-Resistance
- low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- Totally Lead-Free & Fully RoHS Compliant (Note 1)
- Halogen and Antimony Free. "Green" Device (Note 2)

PINNING

PIN	DESCRIPTION
1	GATE
2	DRAIN
3	SOURCE



MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (Note 3)	I_D	$T_c=25^\circ\text{C}$ 8.0	A
Continuous Drain Current		$T_c=100^\circ\text{C}$ 4.5	
Pulsed Drain Current (Note 4)	I_{DM}	28	A
Power Dissipation	P_D	$T_c=25^\circ\text{C}$ 13	W
		$T_c=100^\circ\text{C}$ 3	
Thermal Resistance Junction Case	$R_{\theta JC}$	9.6	°C/W
Operation Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	-55 to 150	°C

Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. Halogen-and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br +Cl) and <1000ppm antimony compounds.
 3. The maximum current rating in package limited.
 4. Rroeritvd Rating: pulse width limited by maximum junction temperature.



ELECTRICAL CHARACTERISTICS(Ta = 25°C unless otherwise noted.)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250uA	100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 80V, V _{GS} = 0V			1	uA
Gate- Source Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	1.2	1.6	2.5	V
Static Drain-Source On-State Resistan	R _{DS(on)}	V _{GS} = 10V, I _D = 5A		60	75	mΩ
		V _{GS} = 4.5V, I _D = 5A		80	95	
Dynamic Characteristics						
Input Capacitance	C _{ISS}	V _{DS} = 50V V _{GS} = 0V f = 1.0MHz		520		pF
Output Capacitance	C _{OSS}			40		
Reverse Transfer Capacitance	C _{RSS}			2.4		
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 50V V _{GS} = 10V I _D = 12A		6		nC
Gate-Source Charge	Q _{gs}			1.1		
Gate-Drain Charge	Q _{gd}			1.3		
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DS} =50V, R _{GEN} =6Ω, V _{GS} =10V, I _D =10A,		16.2		ns
Turn-On Rise Time	t _{rr}			3.2		
Turn-Off Delay Time	t _{d(off)}			13		
Turn-Off Fall Time	t _f			22		
Body Diode Characteristics						
Drain-Source Diode Forward Voltage	V _{SD}	I _S = 12A, V _{GS} = 0V			1	V
Diode Forward Current	I _S				7.2	A
Reverse Recovery Charge	t _{rr}	dI _{SD} /dt=100A/μs I _F =12A, T _J =25°C		45		nS
Reverse Recovery Time	Q _{rr}			63		nC



Typical Performance Characteristics

Fig 1: Output Characteristics

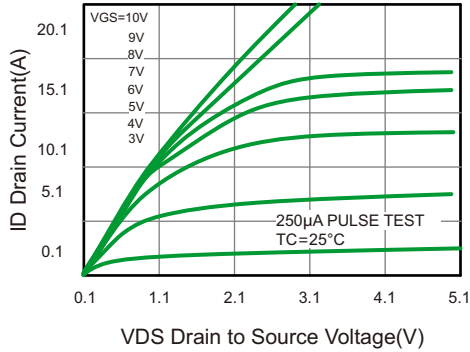


Fig 2: Transfer Characteristics

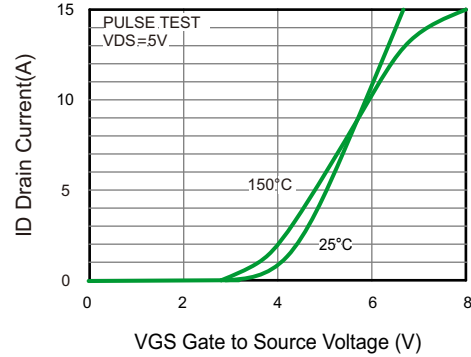


Fig 3: Drain to Source On Resistance vs Drain Current

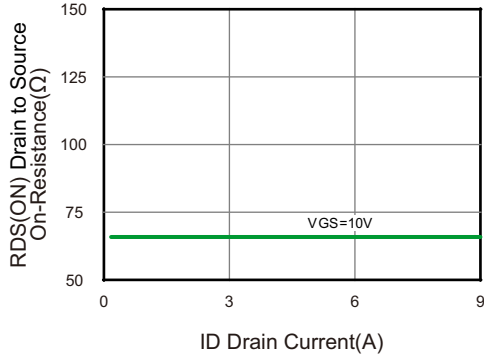


Fig 4: Transfer Characteristics

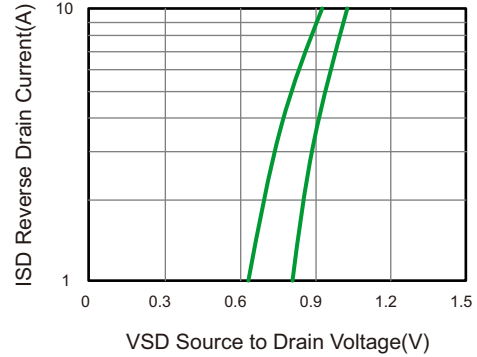


Fig 5: Capacitance Characteristics

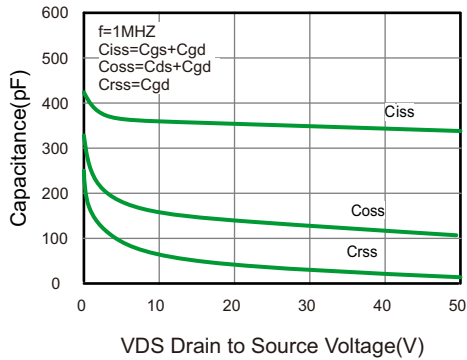


Fig 6: Gate Charge Characteristics

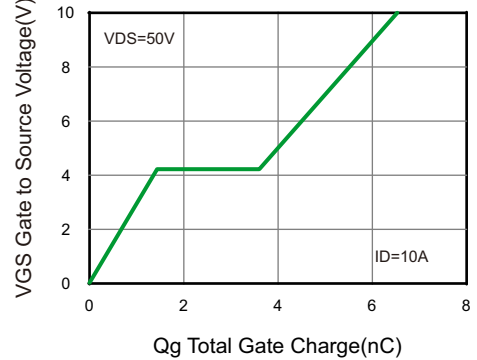


Fig 7: Normalized Breakdown Voltage vs Junction Temperature

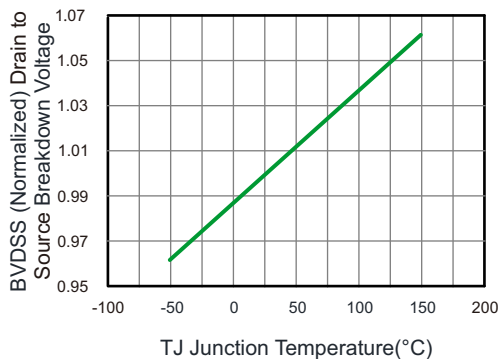
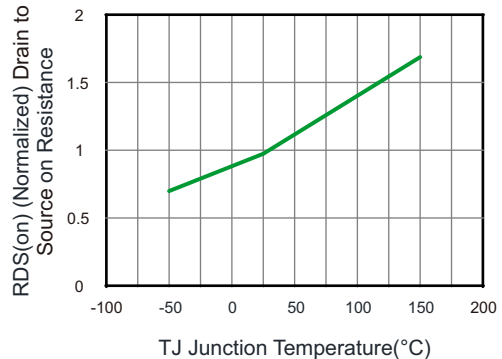


Fig 8: Normalized On Resistance vs Junction Temperature





Typical Performance Characteristics

Fig 9: Maximum Continuous Drain Current vs Case Temperature

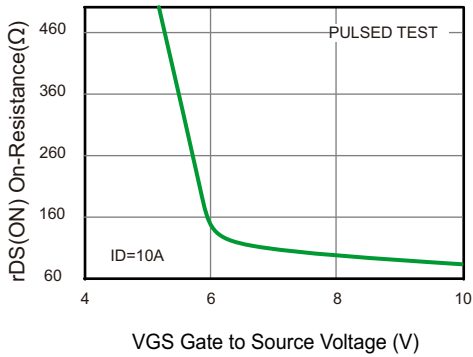


Fig 10: Maximum Power Dissipation vs Case Temperature

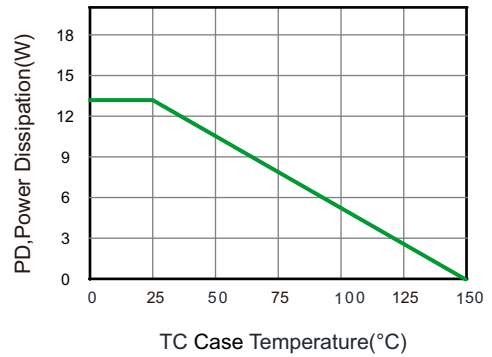


Fig 11: Drain to Source On Resistance vs Gate to Voltage and Drain Current

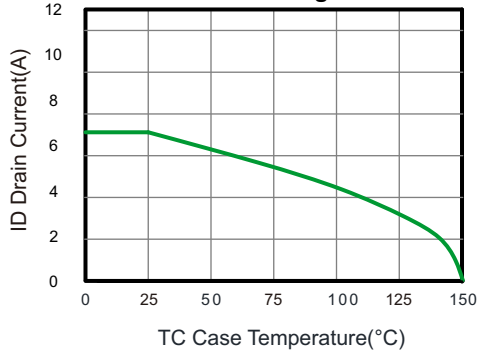
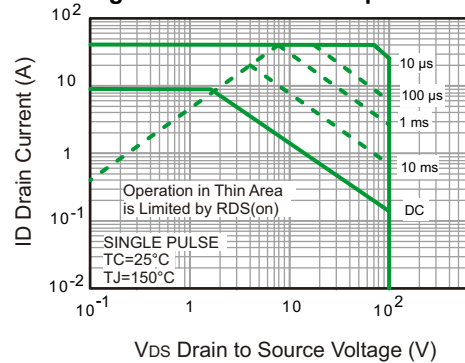
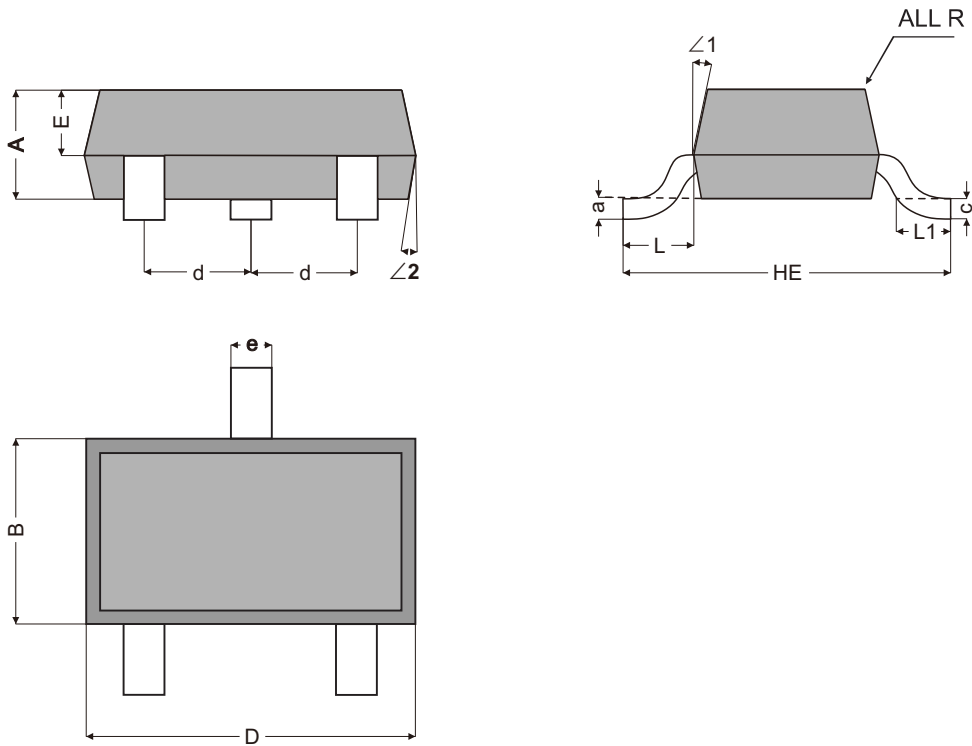


Fig 12: Maximum Safe Operation Area



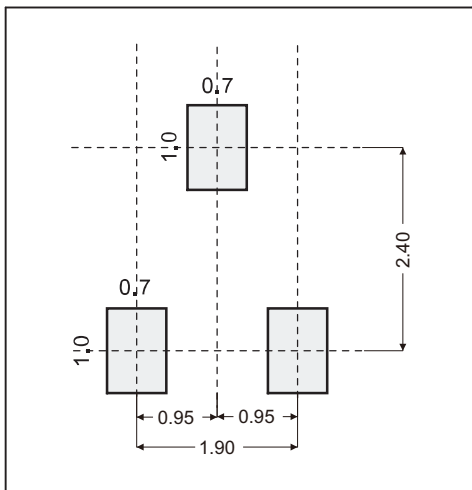


SOT23-3 Package Outline Dimensions



Unit		A	B	C	HE	D	d	E	e	L	L1	a	R	$\angle 1$	$\angle 2$
mm	max	1.05	1.80	0.20	2.90	3.12	1.00	0.65	0.40	0.70	0.60	0.2 (ref)	R0.1 (ref)	12°	10°
	typ	0.95	1.60	0.15	2.80	2.92	0.95	0.55	0.35	0.60	/				
	min	0.85	1.40	0.10	2.70	2.72	0.90	0.45	0.30	0.50	0.20				
mil	max	41	71	8	114	123	39	26	16	28	24	8 (ref)	R4 (ref)	12°	10°
	typ	37	63	6	110	115	37	22	14	24	/				
	min	33	55	4	106	107	35	18	12	20	8				

The recommended mounting pad size



Marking

Type number	Marking code
NM8N10AWR	BK



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