

■ Features

- High speed power switching
- 100% UIS tested, 100% Rg tested
- Enhanced avalanche ruggedness
- Lead free, halogen free

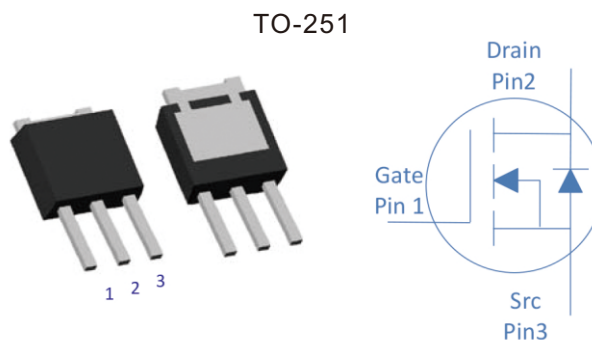
■ Application

- SMPS
- Hard switching and high speed circuit
- LED lighting
- Flyback

■ Main product characteristics

V_{DS}	700V
$R_{DS(on),max}$	850mΩ
I_D	5A

■ Pin Description



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

PARAMETER	CONDITIONS	Symbol	MSL065N15G	UNIT
Continuous Drain Current	$T_c = 25^\circ\text{C}$	I_D	5	A
Drain to Source Voltage		V_{DS}	700	V
Gate to Source Voltage		V_{GS}	± 30	V
Pulsed Drain Current		I_{DM}	14	A
Avalanche energy, single pulse	$L = 8.0\text{mH}$, $T_c = 25^\circ\text{C}$	E_{AS}	100	mJ
Power Dissipation	$T_c = 25^\circ\text{C}$	P_D	35	W
Operating and Storage Temperature		T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

■ Absolute Maximum Ratings

PARAMETER	Symbol	MSL065N15G	UNIT
Thermal Resistance Junction-case	R_{thJC}	1,2	$^\circ\text{C/W}$
Thermal Resistance Junction-Ambient	R_{thJA}	55	$^\circ\text{C/W}$

■ Electrical characteristics($T_J = 25^\circ\text{C}$ unless otherwise specified)

■ Static Characteristics

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Drain to Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	$V_{(BR)DSS}$	700			V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(th)}$	2	3	4	
Zero Gate Voltage Drain Current	$V_{DS} = 700V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	I_{DSS}			1	μA
	$V_{DS} = 700V, V_{GS} = 0V, T_J = 150^\circ\text{C}$			10		
Gate to Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$	I_{GSS}			± 100	nA
Drain to Source On Resistance	$V_{GS} = 10V, I_D = 2.5A$	$R_{DS(on)}$		750	850	m Ω
Gate Resistance	$V_{GS} = 0V, V_{DS} \text{ open}, f = 1\text{MHz}$	R_G		2.9		Ω

■ Dynamic Characteristics(note:5)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Input Capacitance	$V_{DS} = 25V, V_{GS} = 0V, F = 1\text{MHz}$	C_{iss}		560		pF
Output Capacitance		C_{oss}		364		
Reverse Transfer Capacitance		C_{rss}		0.6		
Total Gate Charge	$V_{DD} = 480V, I_D = 2.5A, V_{GS} = 10V$	Q_g		10		nC
Gate to Source Charge		Q_{gs}		2.3		
Gate to Drain (Miller) Charge		Q_{gd}		2.7		
Turn on Delay Time	$V_{DD} = 400, I_D = 2.5A, V_{GS} = 10V, R_G = 10\Omega$	$t_{d(on)}$		26		ns
Rise Time		t_r		27		
Turn off Delay Time		$t_{d(off)}$		23		
Fall Time		t_f		28		

■ Reverse Diode Characteristics

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Diode Forward Voltage	$I_F = 2.5A, V_{GS} = 0V$	V_{SD}		0.9		V
Reverse Recovery Time	$V_R = 300V, I_F = 2.5A, dI_F/dt = 100A/\mu s$	t_{rr}		200		ns
Reverse Recovery Charge		Q_{rr}		2.1		μC

■ Rating and characteristic curves

Fig 1. Typical Output Characteristics

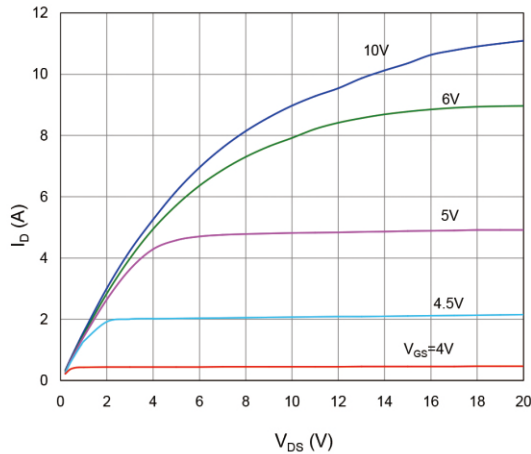


Figure 2. Normalized BV vs temperature

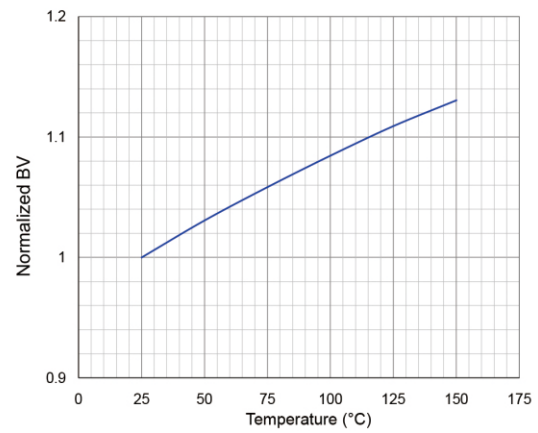


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

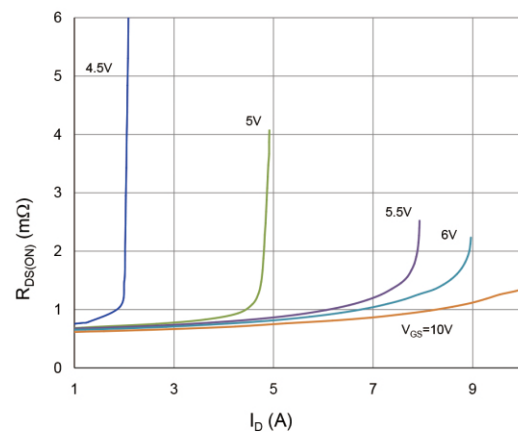


Figure 4. Normalized On-Resistance vs. Junction Temperature

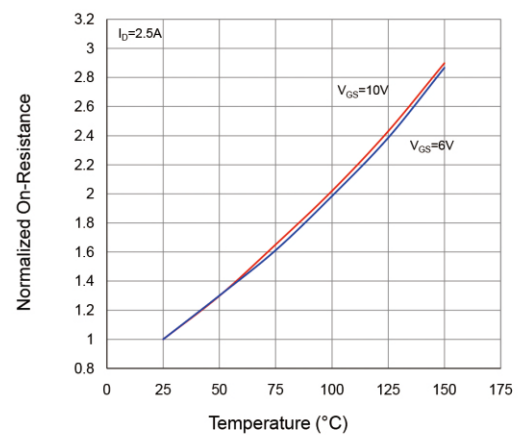


Figure 5. Typical Transfer Characteristics

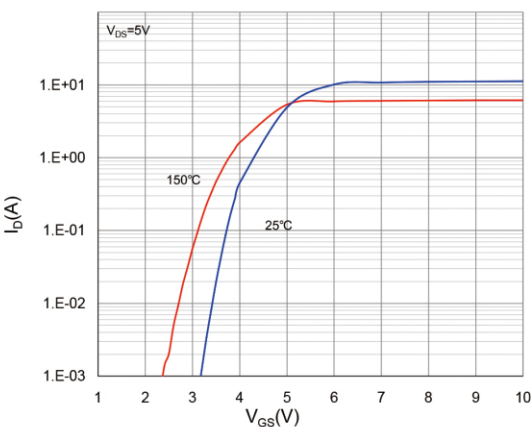
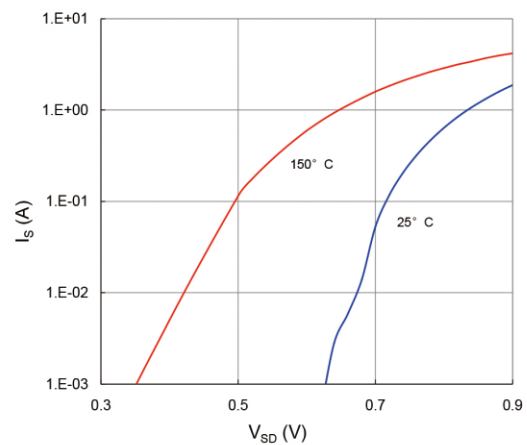


Figure 6. Typical Source-Drain Diode Forward Voltage



■ Rating and characteristic curves

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

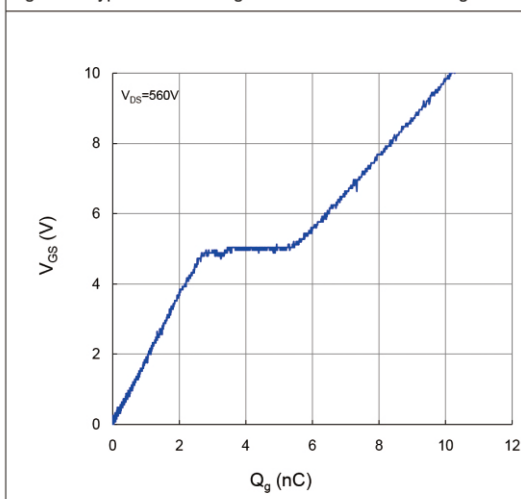


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

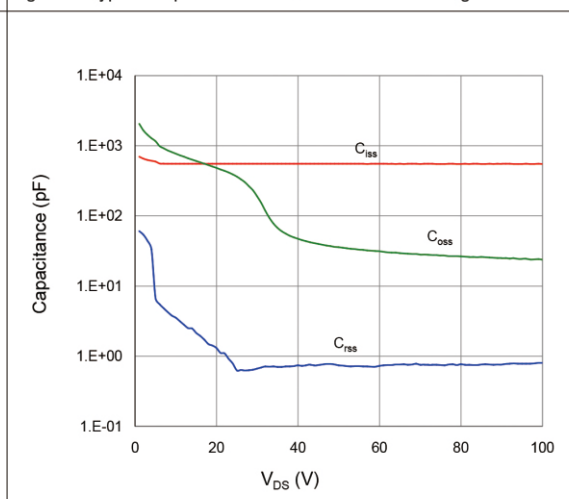


Figure 9. Maximum Safe Operating Area

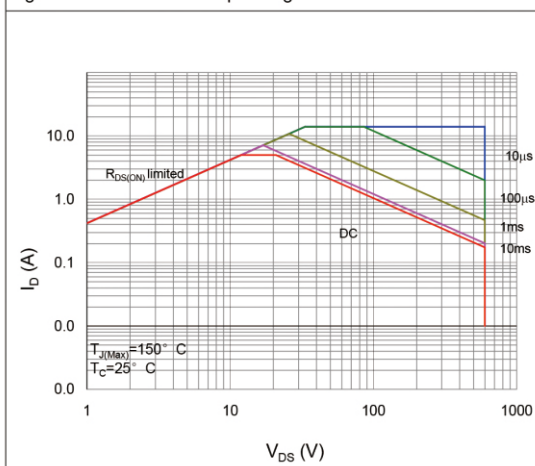


Figure 10. Maximum Drain Current vs. Case Temperature

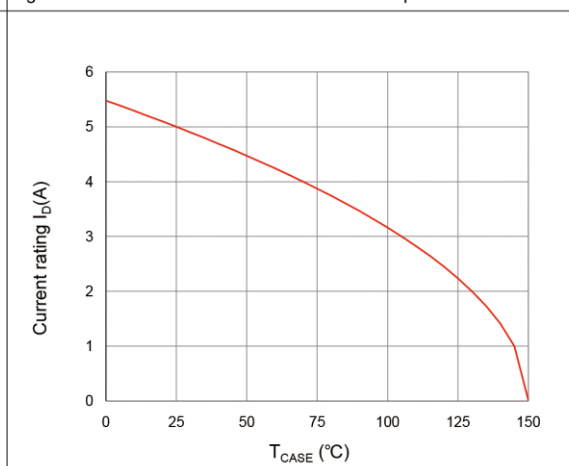
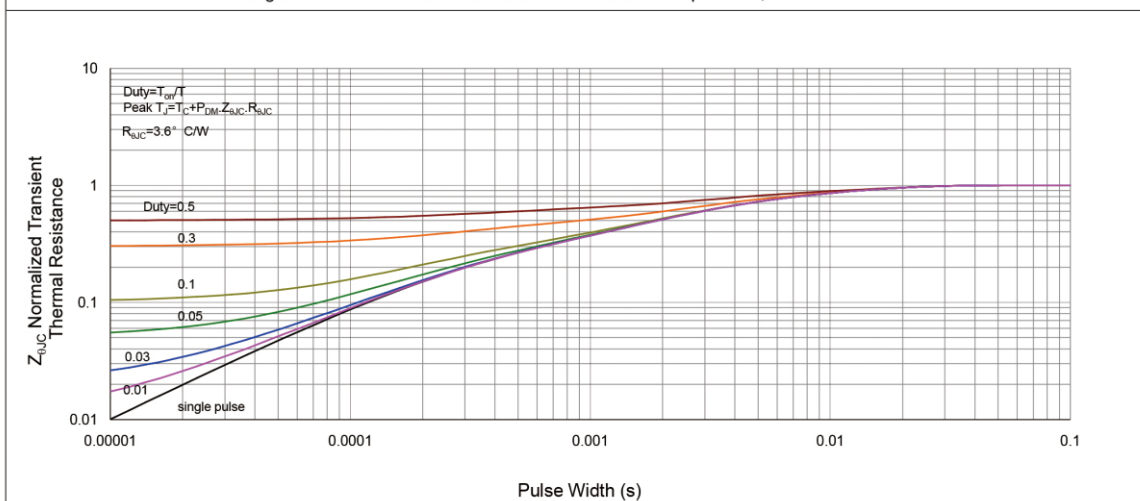
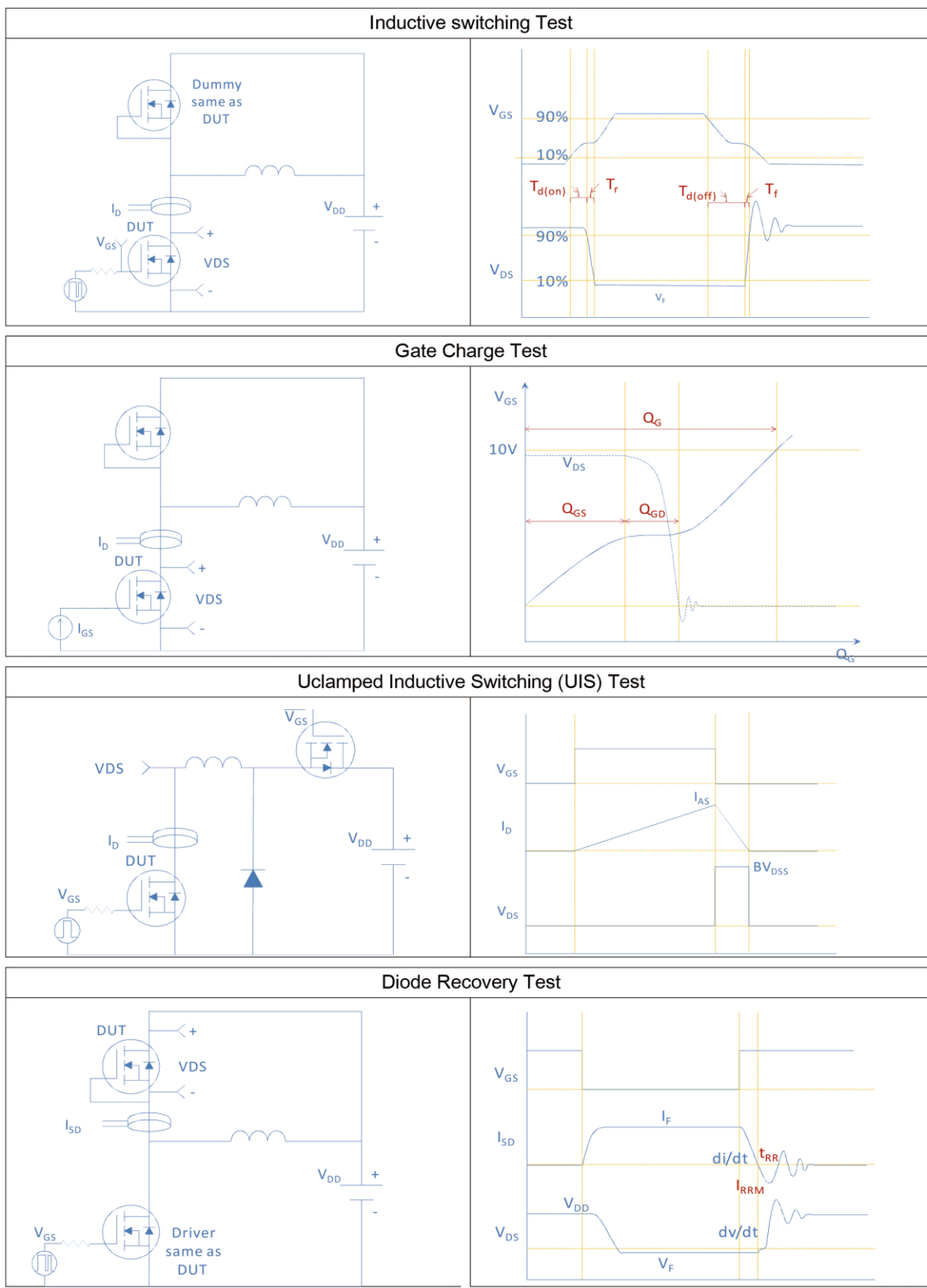


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case



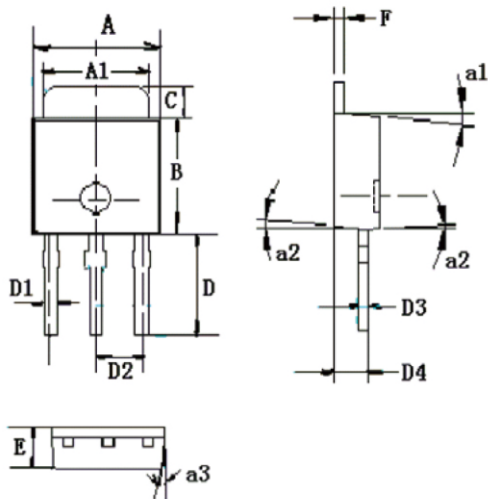
■ Test circuit and waveform



■ Package Outline

TO-251, 3 leads (short leads)

Dimensions in mm unless otherwise specified



Symbol	Min	Nom	Max
A	6.40	6.50	6.60
A1	5.30	7	5.50
B	5.40	5.55	5.70
C	1.35	1.50	1.65
D1	3.30	3.50	3.70
D2	0.60	0.68	0.75
D3	0.55	0.60	0.65
D4	1.72	1.77	1.82
E	2.20	2.30	2.40
F	0.55	0.60	0.65
$\alpha 1$ (degree)		6°	
$\alpha 2$ (degree)		5°	
$\alpha 3$ (degree)		2°	

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