N-Channel 250 V (D-S) Super Junction MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (mΩ)(Typ.)	I_D (A)[a]	Q_g (Typ.)
250	235 at V_{GS} = 10 V	8	25 nC
	240 at V_{GS} = 4.5 V		

FEATURES

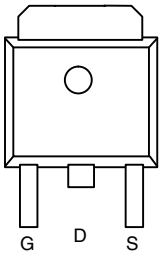
- DT-SJ Power MOSFET
- 100 % R_g and UIS Tested
- Low On Resistance
- Low Gate Charge

RoHS COMPLIANT

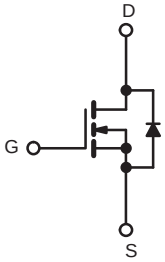
APPLICATIONS

- DC/DC Converters
- DC/AC Inverters
- Motor Drives

TO-252 Pin Configuration



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	250	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	8	A
	T_C = 100 °C		5	
Pulsed Drain Current		I_{DM}	32	
Single Pulse Avalanche Energy		E_{AS}	3	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	62.5	W
	T_C = 100 °C		25	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[b]	t ≤ 10 s	R_{thJA}	-	35	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	-	2	

Notes:
a. Based on T_C = 25 °C.
b. Surface mounted on 1" x 1" FR4 board.

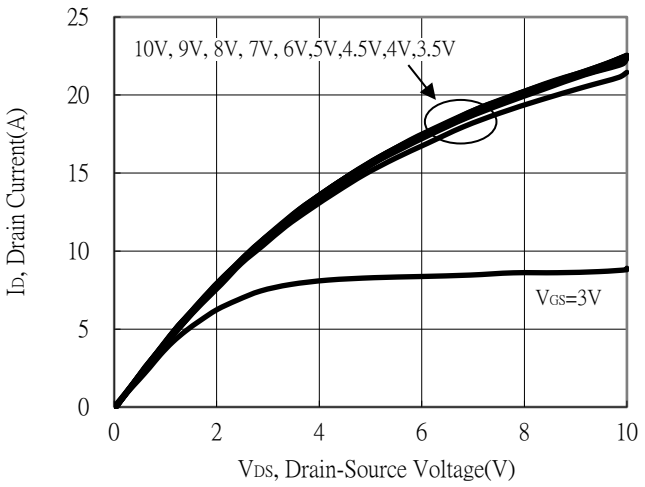
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0, I_D = 250 µA	250			V
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1		2.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 200 V, V_{GS} = 0 V			1	µA
		V_{DS} = 200 V, V_{GS} = 0 V, T_J = 125 °C			100	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 10 V, V_{GS} = 10 V	8			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 3 A		235	305	mΩ
		V_{GS} = 4.5 V, I_D = 3 A		240	336	
Forward Transconductance[a]	g_{fs}	V_{DS} = 5 V, I_D = 3 A		12		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = 125 V, V_{GS} = 0 V, f = 1 MHz		894		pF
Output Capacitance	C_{oss}			36		
Reverse Transfer Capacitance	C_{rss}			22		
Total Gate Charge	Q_g	V_{DS} = 125 V, V_{GS} = 10 V, I_D = 3 A		25		nC
Gate-Source Charge	Q_{gs}			2.6		
Gate-Drain Charge	Q_{gd}			6.4		
Gate Resistance	R_g	f = 1 MHz		3.2		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 125 V, I_D ≅ 3 A, V_{GEN} = 10 V, R_g = 6 Ω		10		ns
Rise Time	t_r			18		
Turn-Off DelayTime	$t_{d(off)}$			49		
Fall Time	t_f			96		
Drain-Source Body Diode Characteristics						
Continous Source-Drain Diode Current	I_S	T_C = 25 °C			8	A
Pulse Diode Forward Current (100 µs)	I_{SM}				32	
Body Diode Voltage	V_{SD}	I_S = 1 A			1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 3 A, dI/dt = 100 A/µs, T_J = 25 °C		68		ns
Body Diode Reverse Recovery Charge	Q_{rr}			158		nC

Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

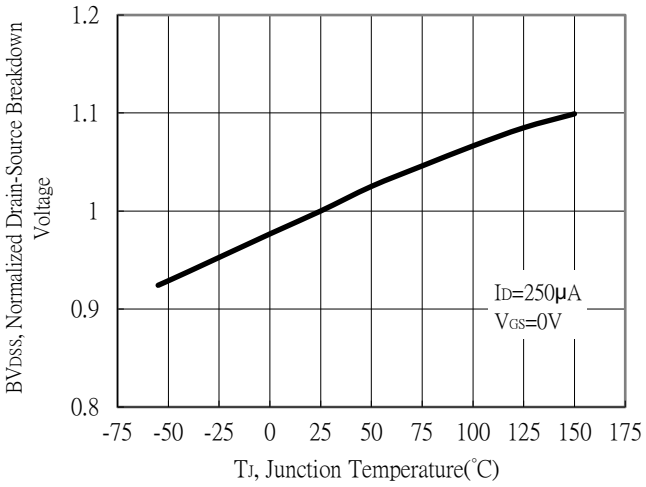
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

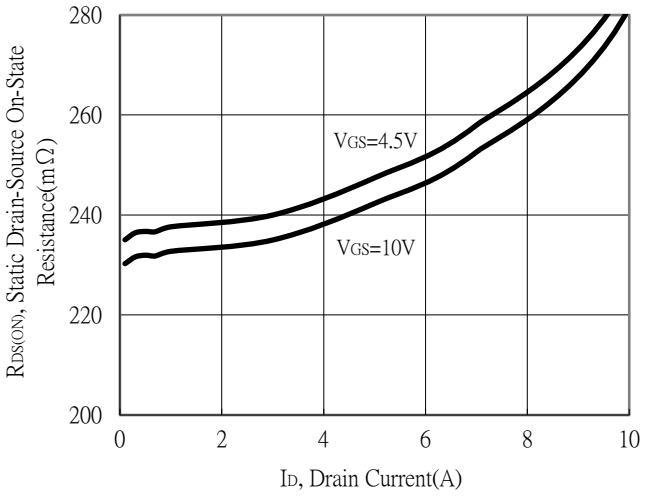
Typical Output Characteristics



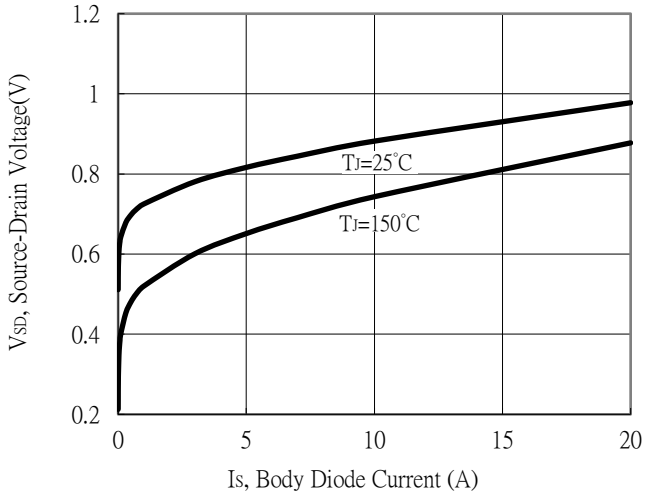
Breakdown Voltage vs Ambient Temperature



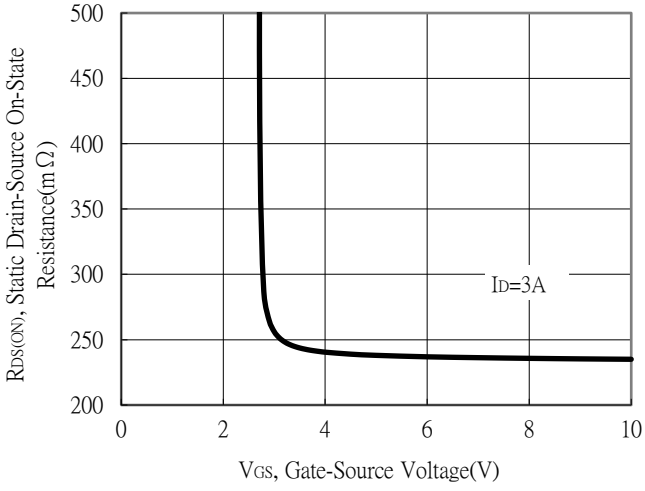
Static Drain-Source On-State resistance vs Drain Current



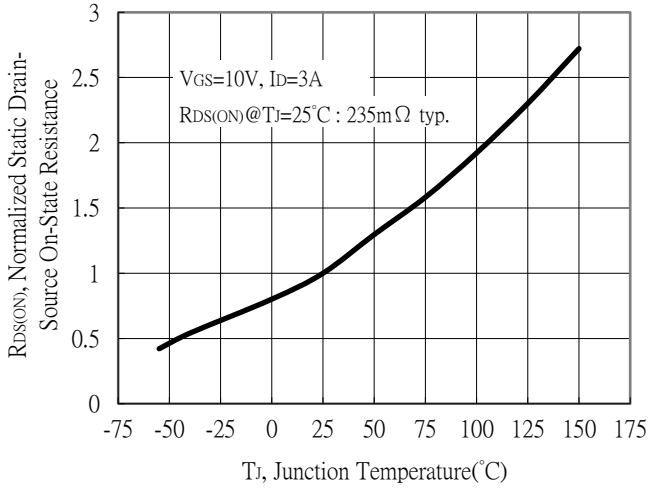
Body Diode Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

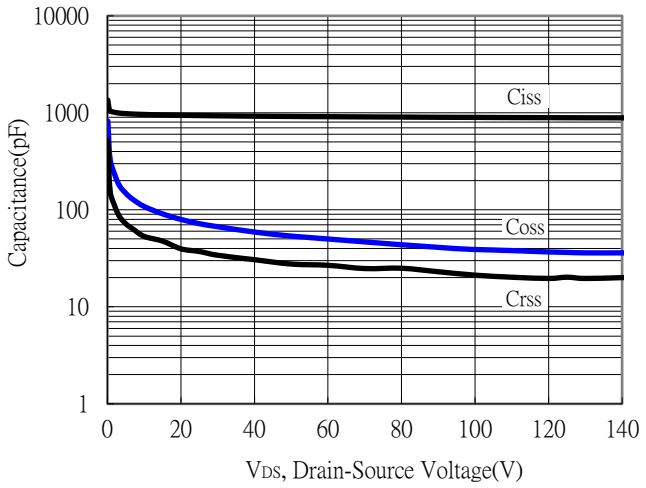


Drain-Source On-State Resistance vs Junction Temperature

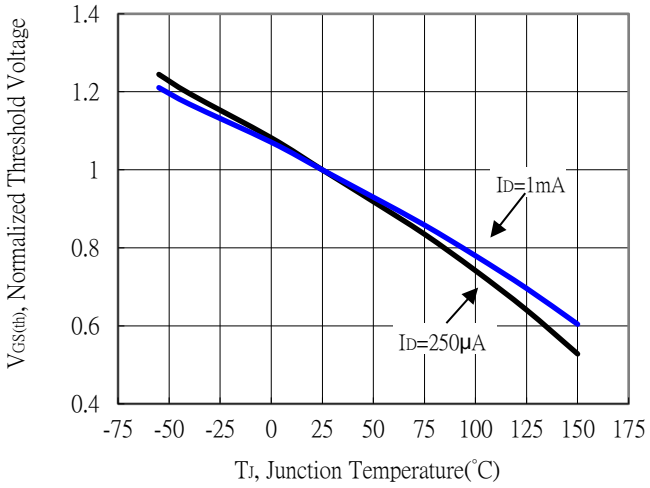


TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

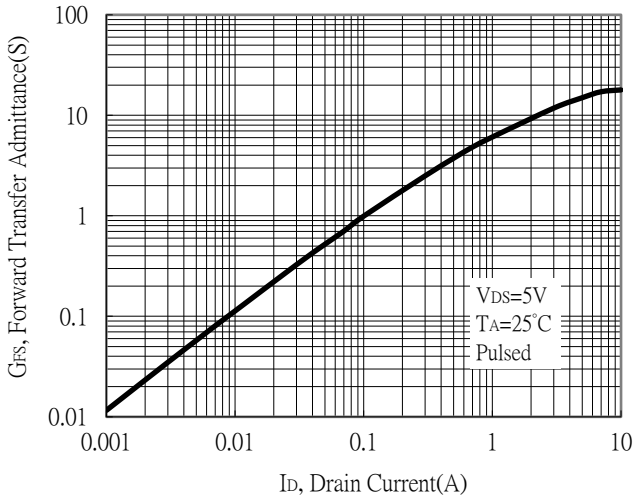
Capacitance vs Drain-to-Source Voltage



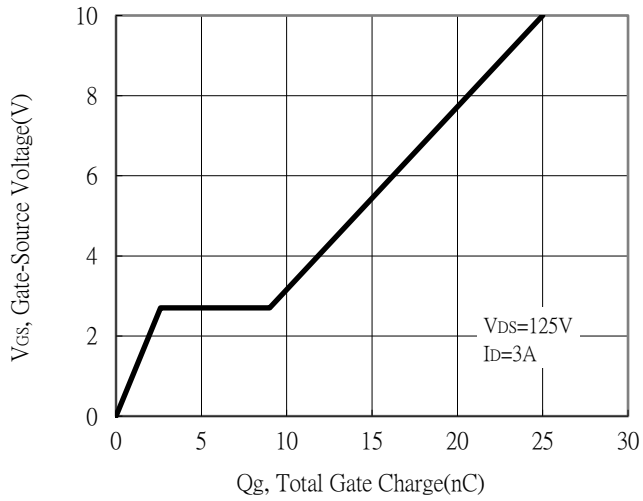
Threshold Voltage vs Junction Temperature



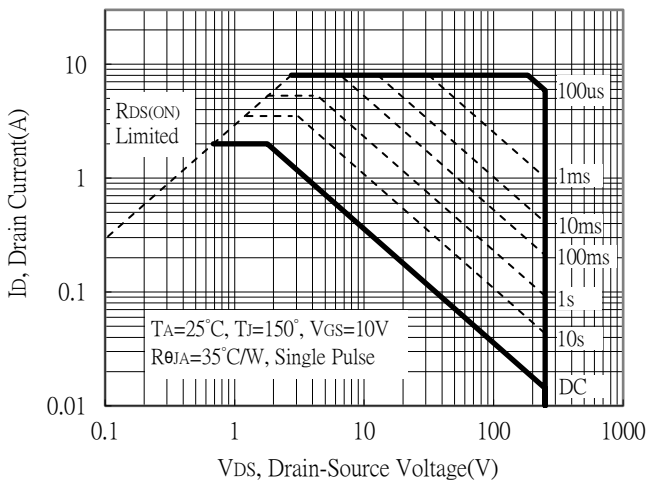
Forward Transfer Admittance vs Drain Current



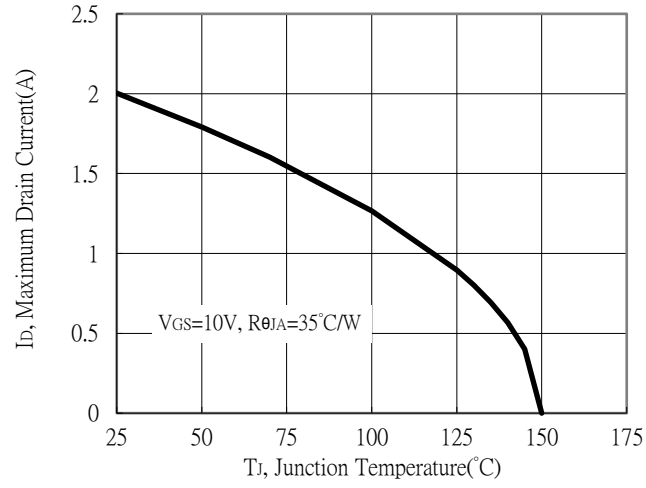
Gate Charge Characteristics



Maximum Safe Operating Area

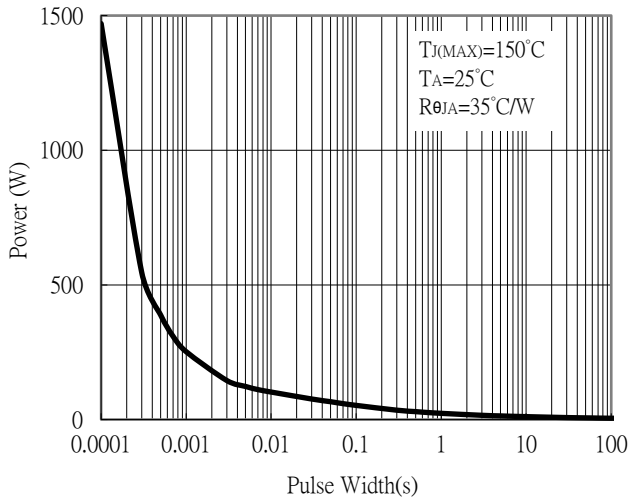


Maximum Drain Current vs Junction Temperature

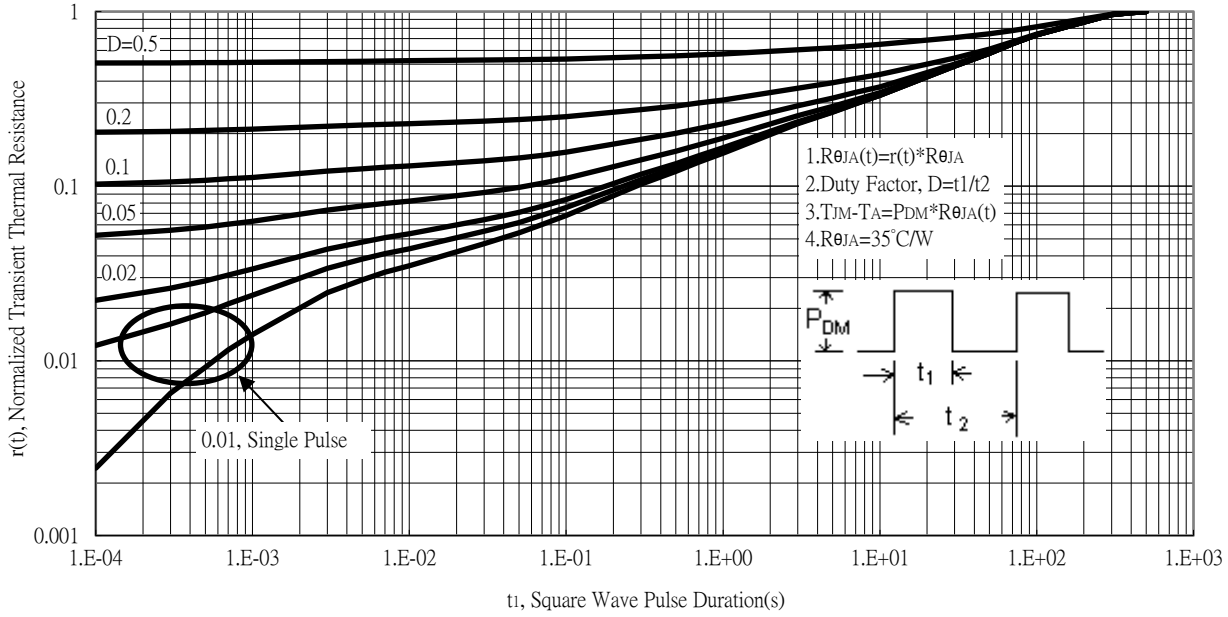


TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves



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