UNIKC Semiconductor

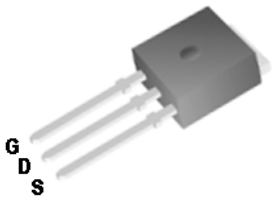
RoHS Compliant

P0165AI

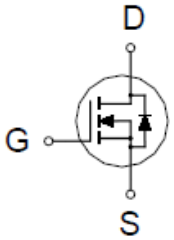
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
650V	14Ω @V_{GS} = 10V	1A



TO-251



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	
Continuous Drain Current[2]	T_C = 25 °C	I_D	1	A
	T_C = 100 °C		0.6	
Pulsed Drain Current[1, 2]		I_{DM}	3	
Avalanche Current[3]		I_{AS}	1.1	
Avalanche Energy[3]	L = 10mH	E_{AS}	5.8	mJ
Power Dissipation[A]	T_C = 25 °C	P_D	27.6	W
	T_C = 100 °C		11	
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		4.53	°C / W
Junction-to-Ambient	$R_{\theta JA}$		110	

[1]Pulse width limited by maximum junction temperature.

[2]Limited only by maximum temperature allowed.

[3]V_{DD} = 50V , Starting T_J = 25 °C

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PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	650			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.5	3.6	4.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±30V			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 650V, V_{GS} = 0V , T_C = 25 °C			1	μA
		V_{DS} = 520V, V_{GS} = 0V , T_C = 100 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 0.5A		9.7	14	Ω
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 0.5A		1		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		168		pF
Output Capacitance	C_{oss}			58		
Reverse Transfer Capacitance	C_{rss}			3		
Total Gate Charge[2]	Q_g	V_{DD} = 480V, I_D = 1A, V_{GS} = 10V		5		nC
Gate-Source Charge[2]	Q_{gs}			3.5		
Gate-Drain Charge[2]	Q_{gd}			0.7		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 300V, I_D = 1A, R_G= 25Ω		12		nS
Rise Time[2]	t_r			40		
Turn-Off Delay Time[2]	$t_{d(off)}$			20		
Fall Time[2]	t_f			30		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[3]	I_S				1	A
Forward Voltage[1]	V_{SD}	I_F = 1A, V_{GS} = 0V			1.4	V
Reverse Recovery Time	t_{rr}	I_F = 1A, dI_F/dt = 100A / μS V_{GS} = 0V		160		nS
Reverse Recovery Charge	Q_{rr}			0.45		nC

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

[2]Independent of operating temperature.

[3]Pulse width limited by maximum junction temperature.

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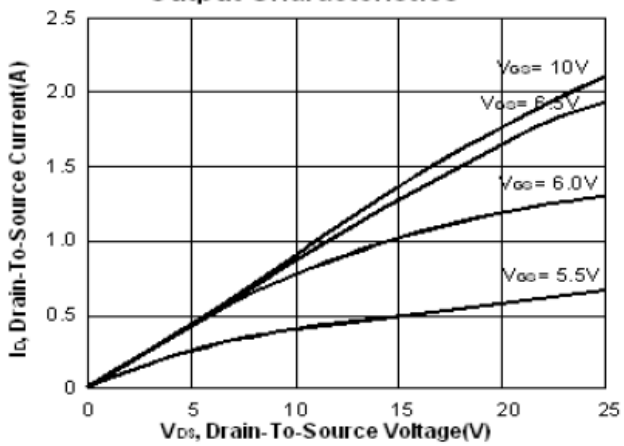
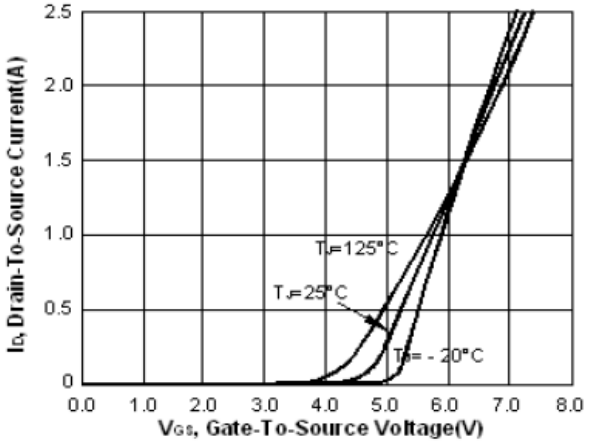
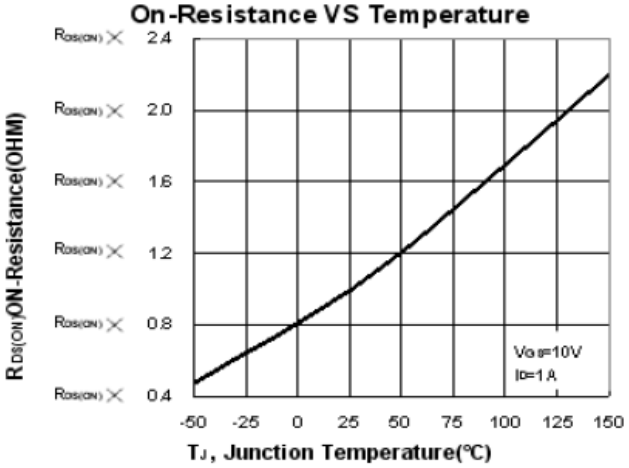
Output Characteristics



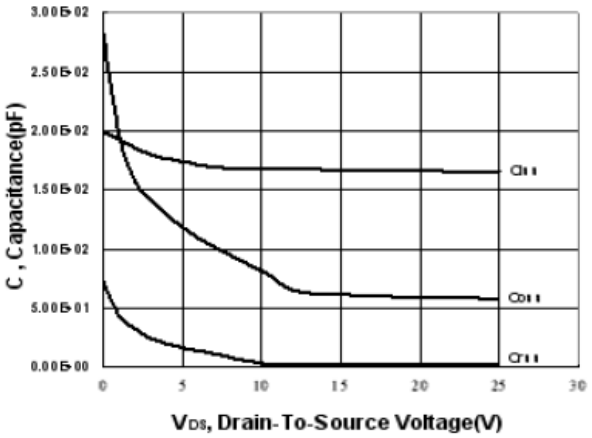
Transfer Characteristics



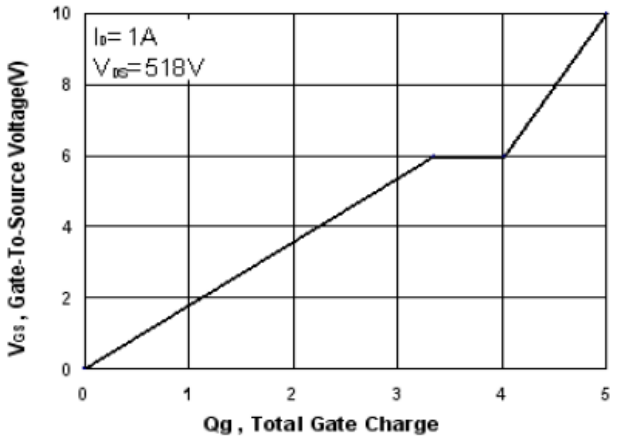
On-Resistance VS Temperature



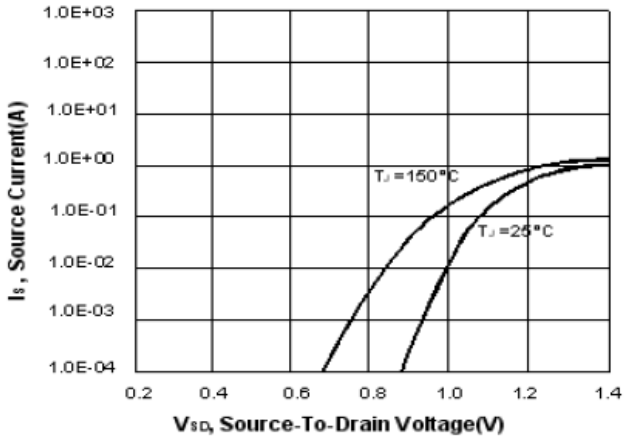
Capacitance Characteristic



Gate charge Characteristics



Source-Drain Diode Forward Voltage



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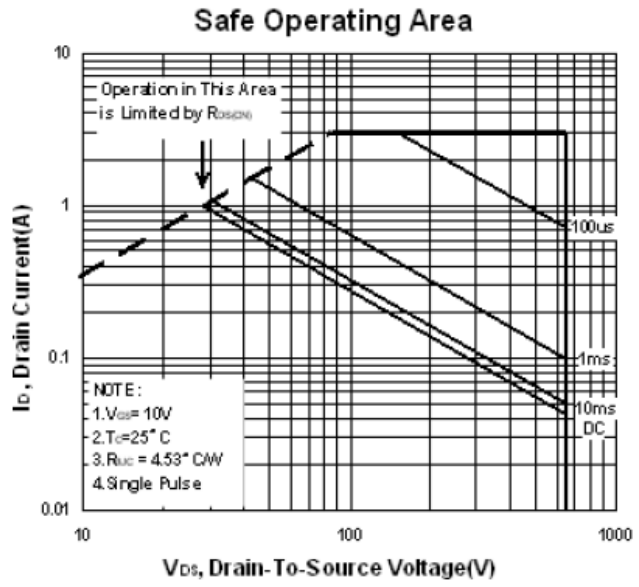

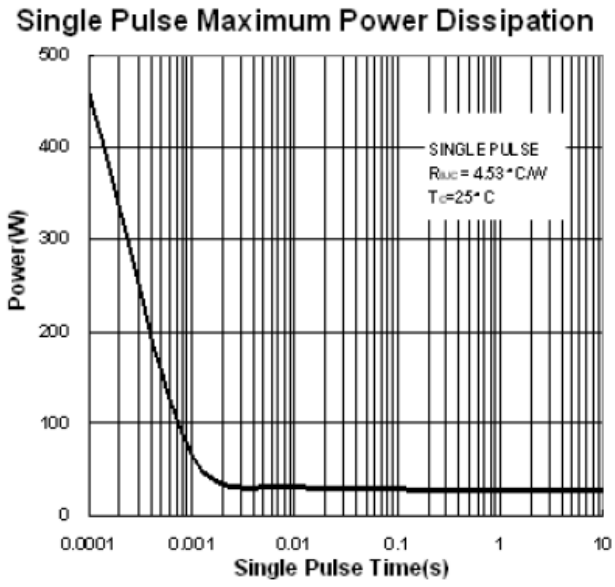

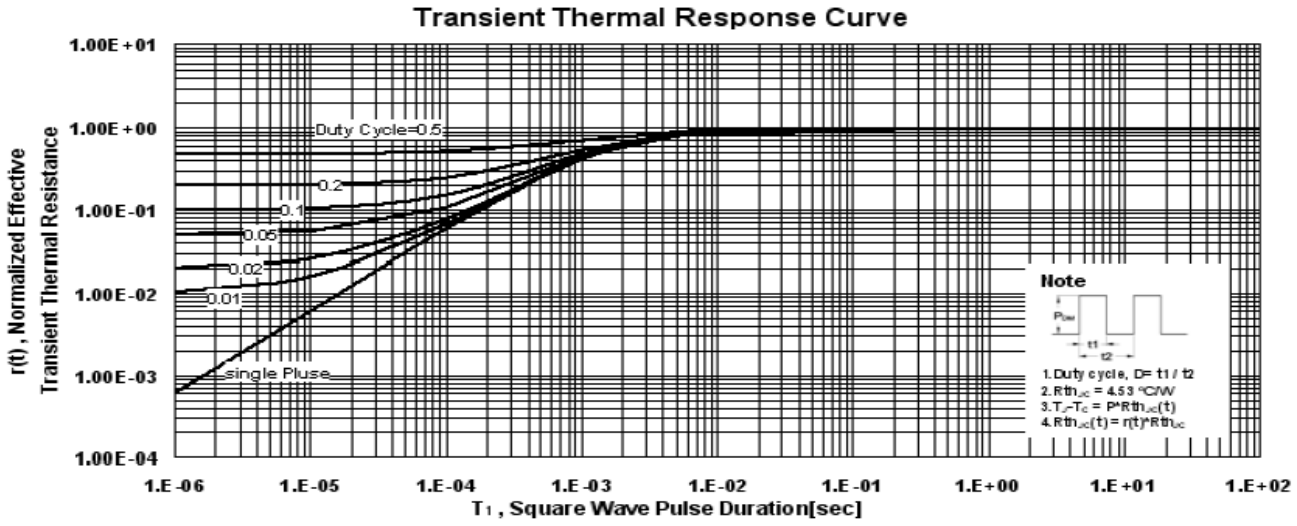

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Package Dimension

TO-251 MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	14	15	17.14	H	0.89		1.7
B	2.1	2.3	2.5	I	6.3		6.8
C	0.4	0.5	0.6	J	4.8		5.5
D	0.35	0.5	0.65	K	0.5	0.84	1.14
E	0.9	1.1	1.5	L	0.4	0.76	0.912
F	7		9.65	M		2.3	
G	5.3		6.22	N	1.4	2.16	2.23