UNIKC Semiconductor

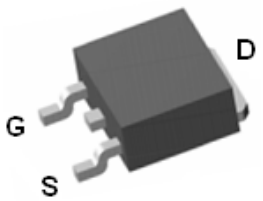
RoHS Compliant

P0603BDL

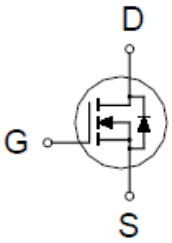
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
25V	6.8mΩ @V_{GS} = 10V	68A



TO-252



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	25	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current[1]	T_C = 25 °C	I_D	68	A
	T_C = 100 °C		43	
Pulsed Drain Current[2]		I_{DM}	160	
Avalanche Current		I_{AS}	52	
Avalanche Energy	L = 0.3mH	E_{AS}	135	mJ
Power Dissipation	T_C = 25 °C	P_D	50	W
	T_C = 100 °C		20	
Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		2.5	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

[1]Pulse width limited by maximum junction temperature.

[2]Limited by package.

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ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	25			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20V, V_{GS} = 0V			1	μA
		V_{DS} = 20V, V_{GS} = 0V , T_J = 125 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	160			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 35A		7	15	mΩ
		V_{GS} = 10V, I_D = 35A		4.2	6.8	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 20A		80		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		2020		pF
Output Capacitance	C_{oss}			719		
Reverse Transfer Capacitance	C_{rss}			483		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.5		Ω
Total Gate Charge[2]	$Q_{g(VGS = 10V)}$	V_{DS} = 15V, V_{GS} = 10V, I_D = 35A		48.8		nC
	$Q_{g(VGS =}$			22.4		
Gate-Source Charge[2]	Q_{gs}			11.3		
Gate-Drain Charge[2]	Q_{gd}			15.7		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V, I_D ≅ 35A, V_{GS} = 10V, R_{GEN} = 6Ω		10		nS
Rise Time[2]	t_r			24		
Turn-Off Delay Time[2]	$t_{d(off)}$			35		
Fall Time[2]	t_f			16.5		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				38	A
Forward Voltage[1]	V_{SD}	I_F = 35A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 35A, dI_F/dt = 100A / μS		37		nS
Reverse Recovery Charge	Q_{rr}			27.3		nC

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

[2]Independent of operating temperature.

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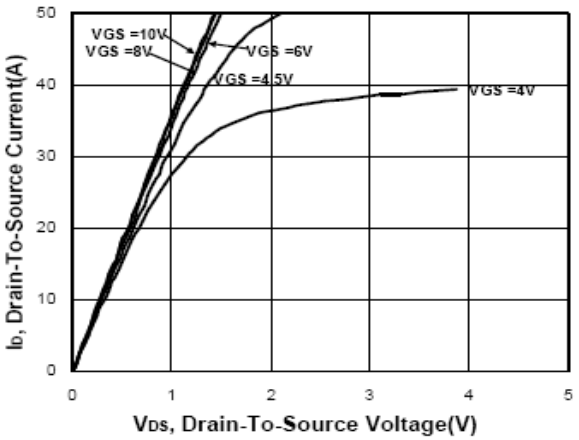
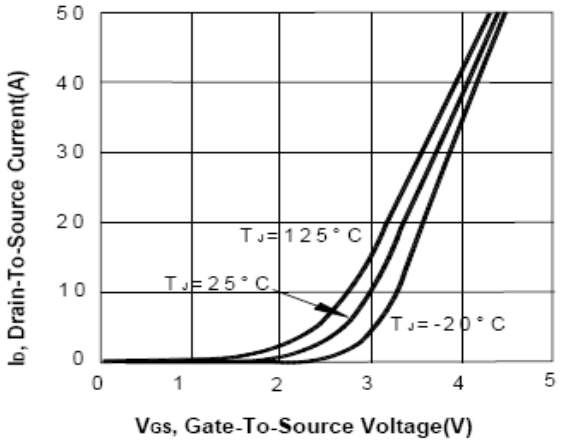
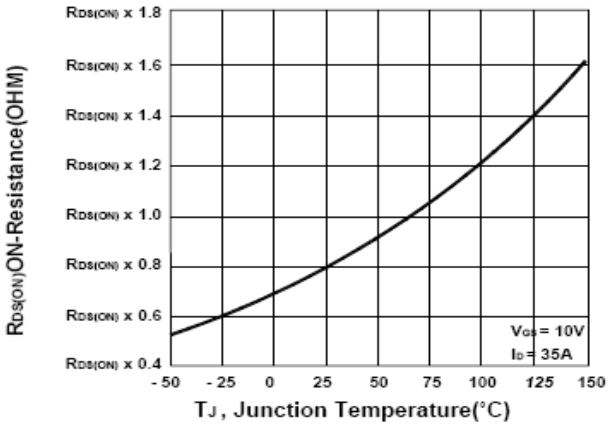
Output Characteristics



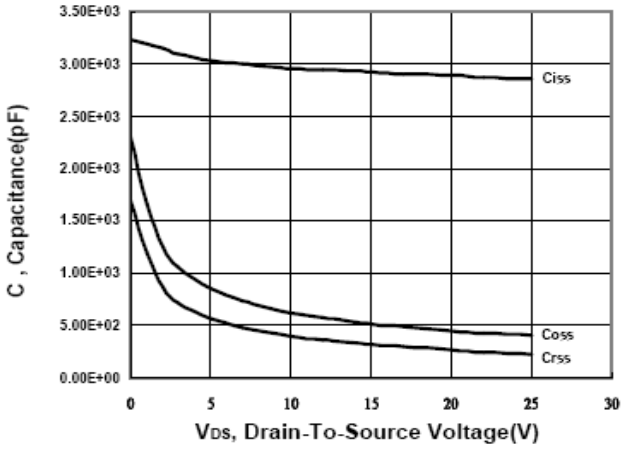
Transfer Characteristics



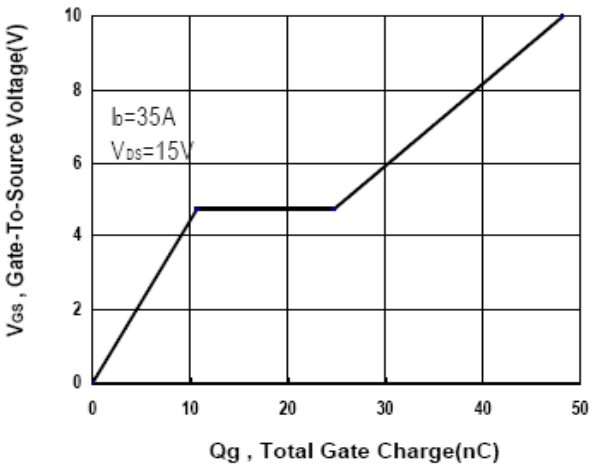
On-Resistance VS Temperature



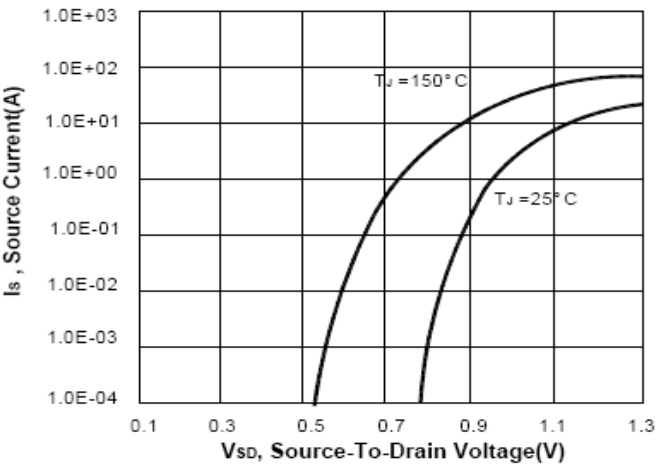
Capacitance Characteristic



Gate charge Characteristics



Source-Drain Diode Forward Voltage



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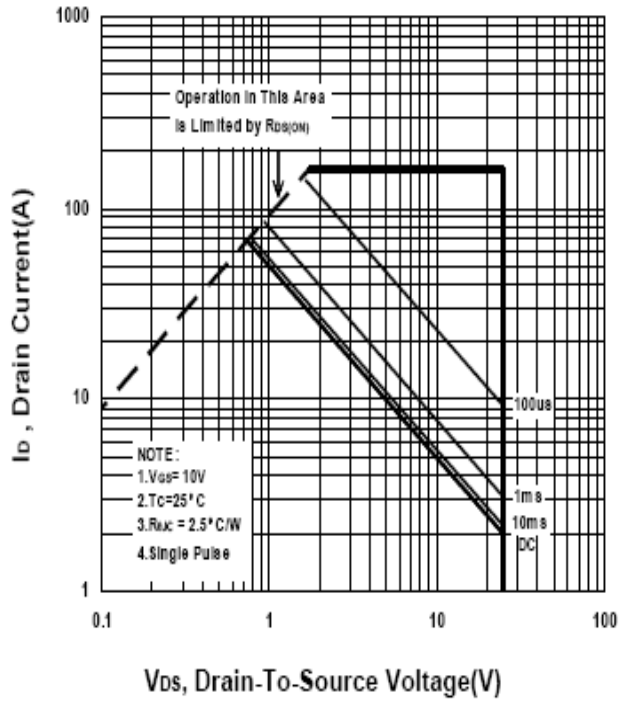
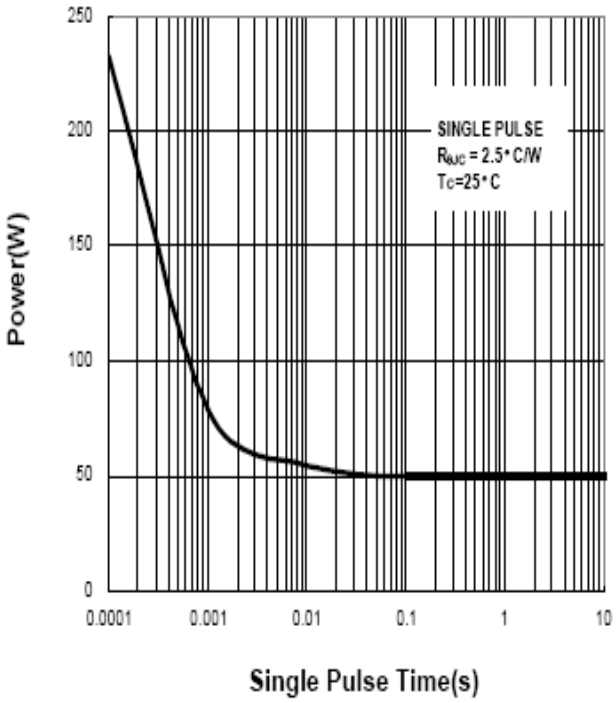
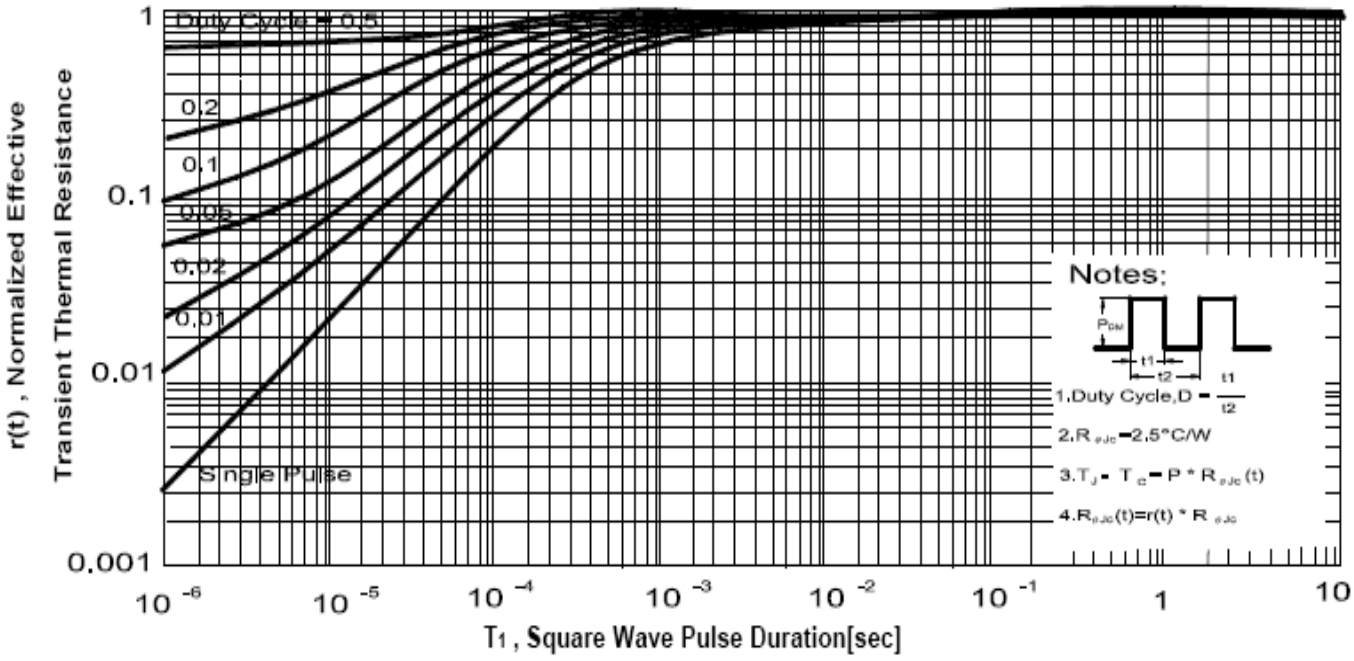
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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Package Dimension

TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.9	10	10.41	J	4.8		5.64
B	2.1	2.2	2.5	K	0.15		1.49
C	0.4	0.5	0.61	L	0.4	0.76	0.91
D	0.82	1.2	1.5	M	4.2	4.58	5
E	0.35	0.5	0.65	S	4.57	5.1	5.52
F	0		0.2	T	3.81	4.75	5.24
G	5.3	6.1	6.3	U	1.4		1.78
H	0.5		1.7	V	0.55	1.25	1.7
I	6.3	6.5	6.8